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The Beattie-Smith Lectures.[1]

(UNIVERSITY OF MELBOURNE.)

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LECTURE I.

MY main purpose tonight is to try to show the need for a wider conception of psychiatry from the practical or realistic viewpoint, rather than the theoretical. My remarks are based on many years of experience, and I have been increasingly more convinced of the necessity of considering any disorder of the mind, not only from the primary aspect of treatment of the patient, but also in regard to his family group.

It is generally agreed in the world of psychiatry today that the Kraepelinian concept of rigid diagnosis is no longer sufficient, or even adequate. Martin James (1948) stated that "Diagnosis is now seen as a continuous process in equilibrium with, and responding to, influences acting upon the patient, whether from within him, or from his external environment".

[1] Delivered at Melbourne on May 11 and 18, 1953.

It is, of course, no new idea that investigation of the patient's environment and background is essential if an accurate idea of wherein and how his condition differs from the normal or average is to be obtained; but in my submission we fall woefully short of real efficiency in this matter.

Even with the work of Adolf Meyer and his followers, whose wider conception of diagnosis is now generally accepted, I do not believe that we have made sufficient practical application of his principle of envisaging the patient's symptoms in relation to his life situation. We all recognize the importance of environment, and to a lesser degree of heredity, in the development of a disorder of the mind; but do we also recognize the importance of, perhaps, the other side of the picture—the effect on the patient's family of the occurrence of his illness?

I suggest to you that this aspect is just as much the duty and function of the psychiatric team as is the treatment of the patient.

I said "the psychiatric team" rather than "the psychiatrist", because I am sure that more than ever in these days is it necessary for the public—the ordinary men and women of the nation—to be educated to the conception of psychiatry, not as something mysterious, taking place within a mental hospital, but as a method whereby they can learn something of what has happened when their relative becomes ill in his mind, how they can best adjust themselves to the happening, how they may dispel the

"fear of the unknown" with which all mind disturbances are fraught, and how these things may often be taught to them right in their own homes.

Then there is the patient returning to his home after some weeks or months in hospital. From the practical viewpoint this situation is one in which too often the relatives are in almost complete ignorance of how to deal with him—of what their manner should be towards him—and too often such ignorance induces resentment (again the fear of the unknown), which may even culminate in the patient's return to hospital.

I do not believe that it is too much to ask that in the not too distant future a psychiatric social worker could accompany the patient home from hospital on his discharge day, stay for an hour or two—perhaps have tea. This member of the psychiatric team would endeavour to smooth over the inevitable awkwardness of this situation.

Those of us who have ourselves had the experience of bringing a patient home after a period in hospital are well aware that this awkwardness or even emotional tension does occur, and I cannot help feeling that this accompanying home of the patient by the psychiatric social worker would pay handsome dividends in lessening the numbers of readmissions — particularly when the psychiatric social worker has previously called, and is well known to both the patient and his family.

I do not believe it would be difficult to arrange—as in fact it was not, within my own experience in England—given numbers of adequately trained psychiatric social workers. Here, of course, we are beaten, but only for the moment, because they will come, just as surely as did the founding of the first real mental hospital—"The Retreat", at York, England, in 1792—and just as surely as other improvements in the care of the mentally ill will come. It is inevitable.

A country such as this will not tolerate a lower standard of care of the mentally ill than that obtaining elsewhere in the world. It is, it seems to me, a matter of time; but it is up to each one of us to make that time short.

If I may be permitted to digress for a moment, I should like to mention with gratitude the important work our newspapers are doing. Every patient who is sick in his mind, and all his relatives and friends, should be grateful to our Press for the really practical help it is giving them.

While the emphasis has hitherto, quite rightly, been on buildings and renovation, I am tonight hoping to show that quantitative improvement in personnel should, and can, go forward hand in hand with improvement in our patients' and their families' comfort, and with their reassurance in the light of fuller understanding.

Endogenous Depression.

Let us consider now, again from the practical viewpoint, a case of disorder of the mind occurring in an ordinary family; say father develops a common affective disorder, an endogenous depression. For some weeks mother, son, daughter and other members of the family group have been becoming increasingly concerned about him—they recognize low spirits, a "fit of the blues"; but father has never been like this before. Many discussions take place out of his hearing, many plans have been made to "cheer him up" or "take him out of himself"—all in vain. Indeed, they seem to make him worse. Also, he is beginning to say strange things—he is not fit to live, or he is the wickedest man in the world. He can no longer go to work.

Mother, if not the children, cannot conceal from herself any longer that this is not an ordinary "fit of the blues"; then what is it? To whom can she turn for help? Well, she has her doctor—the general practitioner, the fundamental keystone of all medical service. She calls him in—the ordinary sending for the doctor.

In the most favourable case or situation the doctor knows the family, has perhaps known father for years. He recognizes at once that he is here presented with a definite mental illness, the treatment of which is beyond his resources. He tells mother this and explains that father will need to see a psychiatrist. This may be regarded as a definite landmark in the course of this misfortune that has struck the family, and much depends on the tact, sympathy and judgement of the general practitioner. He is a busy man; this visit to father is just one of many visits on his list for the day. He has not the time to explain matters fully to mother; but what he can and usually does do is to explain to mother that the psychiatrist is no sort of "bogy-man"—he is a doctor like he is, but he has specialized in just the sort of illness that father has contracted, and he will tell mother what must be done.

Now where has father to see the psychiatrist? The ideal method is for the general practitioner to make an appointment for both father and mother to attend a psychiatric out-patient clinic. There father is examined by the psychiatrist—perhaps also by the psychologist. A trained psychiatric social worker may interview mother.

It is probably decided that father must enter hospital; but by this time mother has got some idea of what has happened to her husband, and by the skilful talk she has heard her fears have to some extent been minimized—the fear of the unknown, while still a fear, is perhaps not so much "unknown".

Here, then, we see the value of one aspect of the many with which the out-patient clinic can deal.

Compare this with the procedure where no out-patient clinic is available. Father is merely "sent to hospital". The general practitioner, with the best will in the world, has not the specialized knowledge and training, nor has he the time either to acquire or impart it to mother, son and daughter; they are often left in the dark as to the nature of father's illness, what treatment he is to have, and for how long, and whether it is likely to be successful; and the big fear, transcending all the others in importance, is that father may be "mental" or "insane".

Now I shall leave father in hospital. His treatment there, both its advantages and its shortcomings, have been well described by abler voices than mine.

I want to consider mother, son and daughter after father has disappeared into hospital—that period of utter silence; father seems to have gone as completely as though he were dead. Mother cannot say to her neighbour across the fence: "Oh, thank you for inquiring. John had his appendix out yesterday and he is as well as can be expected." No. She has to wait, a prey to the thoughts engendered by this fear of the unknown, until at last, she writes a letter of inquiry to the medical superintendent of the hospital and receives a cyclostyled, stereotyped reply, sometimes signed with a rubber stamp.

How much better it would be if she received a friendly, unsolicited, explanatory letter during the first week, containing some definite facts about father — something couched in language she can understand and can talk about to her neighbour across the fence, or her friend when she meets her out shopping. This letter does not seem to me to be too difficult to arrange. It would take only a few minutes of the hospital medical officer's time, and its effect may be very far-reaching.

Mother can, and sometimes does, develop resentment against father. It is a common enough reaction to "the unknown". She says, in effect, to herself: "Why could not father get an illness we could all understand, instead of this queer business which no one seems to understand or can help me with?" It is thus very easy for resentment—a sense of grievance—to develop; and I most earnestly plead for this aspect of psychiatry in relation to the family to be given the attention it so manifestly merits.

Consider father's return from hospital—perhaps on week-end leave. Surely it is important for mother and all the family to welcome him with understanding and unobtrusive help, rather than with a sense of grievance because that member of the family has been the cause of worry and unhappiness.

I am well aware that many fathers do merit such feelings. Mother may have had years of misery trying to please him. But whatever the condition of either the patient or

his family, enlightenment is required, and "personalized" enlightenment—not what people read in the little pocket-sized magazines and may find very hard to digest.

Hitherto my remarks have dealt mainly with the duties of the psychiatric social worker. Now, in my view, we need people trained in this work very urgently—and not only trained, but with an aptitude for the work. Dr. Phillips, in his recent important paper "Psychiatric Consultation in Social Case-Work", said that "social work is permeated with psychiatric theory". With great respect I should like to add that the converse is equally true: "psychiatric theory is (or should be) permeated with social work".

Rather than quote such literature as has been produced on this subject, I should like to tell you about the first psychiatric social worker with whom I was associated, because this was as far back as 1931. He was untrained, except that he had been a mental hospital orderly for over twenty years and was in charge of the visiting room in a large mental hospital. For twenty years he had been asked questions by patients' relatives, and it came to be recognized by the medical superintendent and his medical officers that this man was smoothing the path for our work very considerably. His name was Alex, and my own realization came when the wife of one of my patients told me she had expected to see Alex, but she could not wait long, and added, in a very disappointed manner, that she supposed that I would have to do.

This man had learned in twenty years of dealing with relatives what questions they asked, what worried them most, and had set himself to supply answers as best he could. Of course, his answers were incomplete; but he did form that most valuable link between the patient's anxious relative and the rather remote psychiatrist (too often so in those days).

All through my own psychiatric career I have urged that the psychiatrist alone is severely handicapped unless he is the head of a team in which his psychiatric social worker's activities are regarded as a *sine qua non* in his diagnosis and treatment.

There are many other members of this team—those whose contact is with the patient and those whose contact is with his relatives. I am not at present considering the nurses, occupational therapists, psychologists and ancillary workers generally, whose work lies mainly with the patient, but rather those who deal with relatives, and how their numbers may be increased, and any other means by which a degree of understanding may be brought about.

It is by this means that, in my belief, we shall solve many existing problems in this country concerning the treatment of disorders of the mind. Such disorders are, even more than bodily illnesses, family affairs. Let us then make it possible, or even easy, for each adult member of the patient's family to learn about it, so that he can help.

Alcoholism.

Let us take another form of family-disrupting disorder—perhaps the most serious and unfortunately one of the commonest: alcoholism.

As we all know, this is a vast subject in which almost the entire social and economic structures of the country are involved. What is true of the country is even more true of the family group.

When the psychiatrist is considering a case involving excessive drinking, among the first—the first of very many—questions he asks himself are: "Why did this patient drink to excess?" "What started him?" "What did he gain, or think he was gaining, by his over-indulgence in alcohol?"

I think it must be very obvious that the psychiatrist cannot even begin adequately to answer these questions without a thorough knowledge of the patient's environment, history, interpersonal relationships in his family group, work and social habits and so on.

Stalker (1948) stated that "the key to the psychopathology of the psychopathic states is the concept of immaturity. We may liken the psychopath to the infant." Surely this is tantamount to stating that we must inquire of members of his family if we are to create an overall picture of the illness of real practical value.

I am well aware that in many cases it is possible, after examination of the patient, to say: "This man has a poorly integrated personality structure, he is grossly immature, he is dependent, he is unable to sustain life at his usual social level, and, therefore, he over-drinks."

But is this the whole story? There are similar people who do not over-drink.

Only in one way is the psychiatrist in a position to understand and treat the patient most effectively by whatever methods are at his disposal, and that is in the light of as full a story of the patient's daily life, history and so on as he can obtain.

Now, how is this information to be obtained? Often the psychiatrist may want to interview the relatives himself, but he certainly has nothing like the time to give to gathering a fraction of the information he should have, nor can he, as a rule, visit the home. The member of the psychiatric team whose work this is, is the psychiatric social worker.

This is usually a woman trained in social science, but also in psychiatry. As well as making her report to the psychiatrist, the help she can give to the members of the patient's family is also her job. She can remove to some extent that "fear of the unknown"; she can explain to the wife or husband in simple terms something of the treatment the patient may have. She can form an opinion as to whether the patient should return home after his treatment—whether the home environment is helpful and, if not, whether or not it is alterable and, if so, how this alteration is to be attempted.

Indeed I could continue almost indefinitely to describe her duties; but I hope I have said enough to make very clear how necessary this member of the team is, and particularly to the patient's family.

I am well aware of the excellent training available for social workers here; but we have no training course for psychiatric social workers. I have no shadow of doubt that it will come. This country surely cannot be content to import these people from abroad as at present. This form of training must be made available to suitable candidates for it, and will be in time. I again put forward my plea: let us make that time short.

Divided Loyalties.

Another family situation I should like to mention is that very common one of divided loyalties, perhaps between wife and mother on the part of a young married man. In some of various ways he has become involved in a situation in which his mother requires help or attention of some kind, perhaps financial, and his wife tends to resent it. She says: "I am your wife, I must come first." And the husband retorts: "Look what my mother did for me before I ever met you. Just think what I owe her." I have known this very obvious conscious-level conflict produce or precipitate all degrees of mental disturbance, from a mild reactive depressive state to a complete schizophrenic disintegration.

Leaving aside such considerations of psychopathology as faulty transference and fixation of libido, and again immaturity, let us consider a practical and realistic approach.

Much can be done here by a study of, and help to, both the wife and the mother—often the whole family. If we assume that the patient has a depressive reaction which is fairly easily cleared up, it is surely unwise for him to go back to his wife and mother if they have not had some explanation and help about the situation.

The patient has probably had suggested to him in the course of individual psychotherapy on the conscious level something of this sort: "Your wife is really your next of kin, you know. While you will not neglect your mother,

try to look on the debt you owe her as one to be paid forward—to your children. That is how life goes on: forward, not backward." Surely, at the very least, something on these lines should also be suggested to the rest of the family. Perhaps this is not psychotherapy, but merely an elementary corrective to ordinary muddled thinking. However, experience has shown it to be helpful.

Many other problems of this nature arise—problems between the present generation and the last—and in my opinion their incidence varies directly with the supply of houses. We all know of the urgent need for more and better mental hospital accommodation, and it is indeed an urgent need which will be and is being met. But still, from the psychiatric viewpoint, there is the need for a young married couple to be given the opportunity to acquire a house of their own. I am sure that were adequate housing available, not the least of the advantages that would accrue to the community would be a fall in the incidence of many forms of mental disturbance, including broken marriages. Surely, when a young man is frustrated in such a primitive and fundamental urge or desire as to have a home of his own—his own hearth, with his wife and children round him—it is hardly surprising if he, and his wife also, show at the best signs of resentment against the government, and at the worst signs of neurosis.

Living with "in-laws" is far too common these days, and it is always potentially dangerous as regards peace of mind. It is true, of course, that many young couples of good emotional stability have lived and are living perfectly successfully with "in-laws"; but I cannot help concluding, from such cases as I have been able to observe, that if the couple have the ability to live completely, or almost completely, in harmony with either's parents, then they also have such ability as will enable them to find a home of their own fairly soon.

These are the exceptional couples. There remain the large number who have not that ability—that is, ordinary decent young people. How wrong it is that they cannot start their married life under their own roof—wrong from almost every viewpoint! Each house containing its family group is a unit, which, multiplied many thousands of times, forms a nation; and the nation that regards its population not as composed of individuals, but as composed of family groups, is, I firmly believe, the nation that will lead the world.

I can only hope very hard that this concept is salient in the minds, not only of those concerned with the provision of houses, but also of those concerned with finance.

What better investment could this country have than the young, keen, hard-working Australian man and wife?

Geriatrics.

Continuing our psychiatric consideration of the family, let us look at the former generation—grandad and grandma. As their expectation of life is increasing, we are seeing more patients in the over sixty age group.

In recent years this branch of medical science—geriatrics or gerontology — has tackled the problem of the aged realistically.

It is no new problem in psychiatry; but we can now offer considerable help, other than sending grandad, when he shows mental changes, into hospital—even if by some miracle a bed could be found for him. Again, it is a problem concerning the entire adult family group, and usually the entire psychiatric team.

If it is assumed that admission to hospital is not immediately necessary or desirable, and it has been decided that grandad's functional level is such that he can just be cared for at home, then a psychiatric social worker should call regularly at the house, advise on methods of treatment, and report back to the psychiatrist. I know of cases in which such a procedure has avoided the need for admission to hospital. If only a few old people are kept out of hospital in this way, the salary of the psychiatric social worker is paid perhaps many times over.

I shall not bore you with figures about the maintenance rate of each patient in a mental hospital—the sums can easily be seen in the official reports. What I do ask is that the yearly sum be compared with the salary paid to a psychiatric social worker.

I think it will be seen that the employment of these workers is, from the purely economic angle, a prudent investment.

In every psychiatric hospital there are a few patients about whom the medical superintendent says: "Oh, he could probably go home if his people would look after him. He's now reached a stage of mild dementia and gives no trouble except that he is forgetful and a bit untidy, but he does quite often like to work in the garden." I do not, of course, suggest that the full psychiatric team is a solution to this problem; the difficulties involve, probably, most aspects of the entire social fabric. However, if a complete psychiatric team is available, with several trained lay workers, these cases can be reviewed from time to time.

It may be found that a family group would take a different view of having the patient back home if the members of that group knew that they would receive regular visits from a person who could really give practical help.

Children and Adolescents.

Let us turn now to the younger members of the family, the boy and girl in their teens—a period fraught with psychiatric dangers.

Provided the case is not one of schizophrenia, in which admission to hospital and insulin coma therapy must not be delayed, but is one of the various forms of psychoneurotic reaction to adolescent stress, I maintain that advice to the parents is almost as important as treatment of the patient. It is more than likely that a faulty parental situation exists which must certainly be corrected as fully as may be; otherwise, if the mainly psychogenic aspect of the ætiology is assumed, the effort with the patient is often wasted.

Then we have to consider the younger children, even infants. This at once means consideration of that very effective branch of a full psychiatric service, the child guidance clinic. In England this is regarded as of such importance that the *Education Act* of 1944 laid down that child guidance shall be available for every child throughout his or her school days. This means that the local authorities had to establish such clinics in connexion with the psychiatric units all over the country, and they have proved of great immediate help.

Melanie Klein in 1933 made the following statement:

> Identification with parental figures and their subsequent introjection into the development of the super-ego seems to occur earlier in the child than has hitherto been recognised.

She is really stressing, it seems to me, that the child's character, as well as personality development, cannot be considered apart from the parents, and that the parental identification factor, if I may so call it, in such development is an early phenomenon.

The child guidance clinic was really the first example of true family treatment; that is, the child cannot, of course, be psychiatrically considered apart from its parents.

We all know nowadays how the laying down of faulty patterns at this early stage through frustration, rejection, sibling-rivalry, pampering, or bad example may produce behaviour problems and neurosis in children, and antisocial conduct later on.

It is not within my province tonight to discuss the modern tendency of most civilizations to concentrate people into groups, more or less organized, so that the reactions of the individual can be seen, and to an extent assessed, against the background of the communal trend of the group. It is in the family group that we can find the first attempts at the adaptation of the individual to the community, and it is this we must study and investigate, to the advantage of each member of the group as well as to the patient.

In the second World War a tremendous opportunity occurred for the study of social psychiatry. Whole nations

were divided into groups, or units—some for fighting, some for defence, production and so on. The data gathered at that time have thrown new light on the importance of social influences in the causation of various of the neuroses, and their value can hardly be exaggerated. This was fully dealt with by Dr. Alan Stoller in this lecture in 1948. As always, however, after a war, the family group slowly emerges again. It is our duty not only to consider the patient against this background, but to aid the other members of the group to have some understanding of the patient.

This may well be a tremendous task, but a start has been made; a wife says "I wish I'd known that before", or parents say "We think we see where we went wrong". Surely such understanding must benefit the returned patient or the out-patient still under treatment.

The Therapeutic Community.

In some modern hospitals for disorders of the mind treatment is organized under a group system known as the therapeutic community.

Hoskins (1946) said: "It is a characteristic of the neurotic that he cannot see his life situation whole and undistorted." Much earlier than this, the poet Robbie Burns included everybody when he wrote:

O wad some Power
the giftie gie us
To see ourseis as
ithers see us!

That is one consummation devoutly to be desired in this form of treatment.

The main principle is that everyone coming in contact with the patient is concerned in his treatment—his fellow patients as well as all members of the staff. Once such individual physical therapies as he may require have been completed, usually during the morning, the rest of the patient's waking hours continue his treatment, just as he takes his share in the treatment of others.

Relatives and friends are encouraged to come to the hospital and to take part in some discussions and in other group activities. Individual patients' problems are discussed by the group—perhaps "acted out" as a little impromptu play—the psychodrama, about which I shall say more later.

The therapeutic community has been established in one section of the Repatriation Psychiatric Unit, and it is one of its aims that, when the patient returns to his home, he will find that his relatives have learned at least something about his illness; his wife has visited him there and taken part in a discussion group; the psychiatric social worker has got to know them both. Various former home difficulties, he finds, have been "ironed out".

He returns to work with a degree of confidence which was impossible under the old system, under which he was simply discharged from hospital back to the same unaltered environment, to face the same problems, with his own treatment as his only defence against recurrence of his symptoms.

Now the therapeutic community is a form of group psychotherapy—indeed, I like to think of it as an extension, as it were, of the family group. Like all psychotherapy, it has been used (if not so called) all through history—that is, the group mechanisms were used without conscious knowledge of their essential nature. An orator addressing a crowd, Henry V's address to his troops before Agincourt, a schoolmaster with his class, all provide examples. However, because of the dislike, fear and indeed horror with which mental disorders were regarded in the past, group psychotherapy is of very recent origin. Klapman (1946) gives it as forty years; probably Moreno's work with children in the Vienna gardens in 1911 was the first really organized attempt.

The therapeutic community is of even more recent development, and the post-war organization of the hospital at Sutton, England, is the pattern on which we have based our methods in the Repatriation Department.

The patient, on his admission, and after the brief reception formalities have been completed, is taken in charge not by a nurse or orderly, but by a patient selected from a group of patients—the reception committee. He is taken round the hospital, shown his ward, bed and locker, and lavatories, and introduced to his fellow patients. The use of Christian names is encouraged. He is given an explanation of the running of the hospital, and can ask what questions he likes. Next morning he is examined by the psychiatrist, who has previously obtained and studied a very full history of the patient's illness, and particularly of his family.

At this first interview the patient may be allotted to a group—that is, a number of patients whose illnesses show certain trends, as far as possible common to all. The optimum number in each group is eight to ten. Then the patient's activities are planned for him for the entire day.

This "planned day" principle is in my opinion exceedingly valuable. I have been a psychiatrist long enough to remember the time, more than twenty years ago, when a neurotic patient was left for long periods of the day—often for the whole day—entirely to his own devices, to nurse his neurosis and increase his self-absorption. The difference today is very striking.

The results of our first year's working are being prepared now, as well as a more detailed account of the method, by one of my colleagues and will be published shortly. However, I should like to mention one practical application of the group and therapeutic community method which was successful.

As the patients were permitted a considerable amount of freedom, there had grown up at one time a habit of bringing in liquor; we used to find empty bottles in all sorts of odd corners. It was my opinion that we ourselves—the staff—were really responsible. Had we been successful in getting the patients really interested in their recovery and rehabilitation, this would not have occurred. The problem was tackled on the group principle. Some 10 patients were formed into a discussion group; they were not selected, except that no psychotic patients—that is, patients without insight, who lacked realization that they were disordered—were included. They were invited to talk about their ideas of what being in hospital really meant to them; did they regard it as a sort of holiday? Particular care was taken not to "lead" them in any way, and no reference was made to drinking until one member of the group, as it had been hoped, raised the point himself. Even then the psychiatrist did not comment, but merely said that ever-recurrent phrase in this form of therapy: "Well, what does the group think?" Other members spoke, and gradually, over some days, without any lead, the remarks became more and more definite that to come to hospital for a cure of your nervous trouble and then to "hit the grog" was just senseless. This group was then split up to join other groups, and ultimately, after some setbacks and difficulties with individual patients, an atmosphere that it was "not done" to drink while under treatment became apparent throughout the hospital.

The important point is, I believe, that this happy result was achieved by reason of the group's influence upon the individual—the creation of an atmosphere. This influence, as everyone knows, is difficult to define, but is a most powerful deterrent to the individual who desires to behave in a manner contrary to it. It is certainly more effective than legislation, which would at once have generated resentment and rendered any form of psychotherapy useless.

Nowadays the problem of drinking at this hospital has virtually disappeared. Also our "wives' group" confirms this.

This is a discussion group formed of wives, mothers, sweethearts, sometimes sisters of the patient, and it meets weekly under one of the psychiatrists. It has proved most useful, if for one reason only—that the general demeanour of the patients while home on week-end leave is discussed; once again this is the principle of the family sharing in the treatment of the patient.

Another support to my contention that psychiatry is a family or group matter is the success of the psychodrama as an aid to the elucidation of below-conscious-level conflicts and tensions.

The term psychodrama was first used by Moreno in Vienna in 1911. It does not seem to have been used extensively except for children until Moreno introduced it to America in 1936.

This method has been popularly described as "acting your troubles away". Briefly, it consists of members of the group assuming roles in accordance with the people concerned in one patient's main problem. The only written word is a bare statement of the problem and the list of the "cast". There is no "script", and the situation is allowed to develop entirely spontaneously. The psychiatrist may also take a role or may be one of the audience. Usually the little play is performed before several patient-groups who join up for this purpose, and a general discussion is held afterwards. Perhaps one member of the audience considers that one character should not have behaved as he did—that he should have taken a stronger or a milder line, and so on. The results have so far been most encouraging.

Before this method was used we decided that we would practise it amongst ourselves—that is, all members of the unit, psychiatrists and all ancillary workers. We each took a turn at presenting a problem, allocated the parts and "acted it out". The results were really surprising and at times not a little embarrassing. The various personality traits in all of us became very sharply defined—indeed, so much so that after we had acted some ten "plays" it was unanimously decided that we would stop the practice among ourselves, lest perhaps some quite private traits or trends might be uncovered.

It was certainly a most striking demonstration of the value of the method, and there is not one of us who took part in the "practice" who is not firmly convinced that the psychodrama is a really worthwhile addition to our therapeutic armament.

Another very important activity in the therapeutic community is occupational therapy, or "O.T." as it is called.

This is a vast subject on which I shall touch but briefly by endeavouring to define what is meant by the term. I am not at present considering diversional therapy.

I fear that a certain amount of misapprehension is current as to the aim of the method. It has always been a cardinal principle that to occupy the mind — or more specifically, to discourage the mind from being occupied with the self—is sound therapy. From the earliest times in mental hospitals the patients who were able to do so helped with the domestic tasks, and still do so. It was about 1929 that Simon of Gutersloh, in Germany, commenced to organize occupation or work as a therapeutic measure. This was done earlier in America, I believe.

In my view Simon should be given the credit for the renaissance of occupational therapy in Europe, although the honour has been claimed for several workers. He called it *Arbeitentherapie*, and it spread rapidly throughout Europe. By the middle 1930's nearly every mental hospital in England was building pavilions or setting aside rooms for this treatment.

I should like to stress that there is, or should be, a difference in the method of using occupational therapy in a mental hospital for chronic psychotic patients and in one for patients with a recent psychosis with a good prognosis and for psychoneurotics—that is, patients who realize to some degree that they are mentally disordered.

In the former the aim is to prevent or postpone the onset of dementia, or even to stabilize the patient at a functional level at which he may be tolerated by his family again and continue his occupation at home.

In the recent case of psychoneurosis the aim is somewhat different, and perhaps I am on controversial ground here when I state that it is the work the patient puts out that has the therapeutic value, not the finished article.

It is frequently stated that it is in the sense of achievement and satisfaction the patient gains from contemplation of the finished job that the therapeutic value lies. After a good many years' interest in and experience of occupational therapy I disagree with this view, largely because it is purely at conscious level. I do not deny that such a satisfaction may occur; but as a matter of observation it is seen to be transient and the patient often feels that certainly he has made this leather bag or that basket because he was shown how, but that it has not really affected his problem. It is here that occupational therapy must be combined with psychotherapy. Perhaps the patient is asked to consider what was going on in his mind while he was actually making the article, and to remember that while he was so employed he was at least not thinking about himself.

His attitude to the work should be brought into the group situation and compared with that of the others. Then there is the home position. Did he have any hobbies? Or would he like to continue at home the craft he has learned in hospital? I have known on more than one occasion a clue to be gained as to subconscious frustrations, from the patient's saying that he would like a hobby like leather work at home, but his wife would be sure not to let him do it, as it would make a lot of dust and rubbish on her newly cleaned floor.

The below-conscious therapeutic effort in occupational therapy should be constantly stressed. There is risk that occupational therapists may become mere craft instructors—a big waste of their excellent training.

Ideally, occupational therapy should be prescribed by the psychiatrist just as he might prescribe a course of vitamin B_1, and he should not write his prescription for occupational therapy until he knows his patient well and is able to state whether sedative or stimulant work is required. It is the occupational therapist's task to choose a craft of the type prescribed and acceptable to the patient.

Such crafts as metal work of the tinsmithing type, lathe work, pottery and carpentry are in some schools classed as stimulant work, and weaving with "Ivorine" tablets and small hand-looms, basket work, painting, designing and sorting yarn as sedative work. However, the distinction is far from absolute, and much depends on the individual patient and his background, of which the occupational therapist should have considerable knowledge, gleaned from talks with the psychiatrist.

During the sessions of work, psychotherapy should continue.

The occupational therapist must move round from patient to patient, with encouragement and help to him, not only—or indeed mainly—with regard to his craft, but with regard to what he is gaining by doing this work; here is the opportunity for pointing out how he is forgetting his "self", how he is exercising parts of his mind that he has formerly rarely used, how the fact that he can tackle this problem of a new bit of work means that he can also tackle his own problem in a more rational manner and with more chance of success than ever before.

The occupational therapist is in close touch with the psychiatrist. When he visits the shops she joins in his talks with the patients, often in accordance with a prearranged plan. Only in this way, in my view, can the full potential value of this therapy be made effective.

Conclusion.

In my next lecture I hope to suggest further practical methods of psychotherapy with special reference to creating and maintaining the family's role in the patient's rehabilitation.

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EOSINOPENIA AND OTHER HÆMATOLOGICAL EFFECTS IN ADRENALECTOMIZED RATS AND MICE AFTER THE INJECTION OF A CASEIN HYDROLYSATE "AMPARON".

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In previous reports it was concluded that the casein-digest capain exhibited vasoconstrictory activities in shock patients (Hissink, 1944, 1950). This conclusion was based upon the significant and rapid improvement of the circulation in shock patients after the administration of small amounts of the concentrated preparation (15%). The presence of vasoconstrictor properties was confirmed in experiments with the intravenous injection of capain into rabbits (Brinkman *et alii*, 1945). Small arteries which were visible through Lewis chambers placed in the ears of these animals regularly showed constrictions about ten minutes after the injection of the hydrolysate.

It was thought worth while to study the effects of this preparation when administered locally upon the smallest vessels of the peripheral circulation in laboratory animals, which had been brought into a shock syndrome. Such investigations are in progress and will be published later. However, some observations suggested the possibility of "cortisone-like" activities of the casein hydrolysate upon certain minute vessels. Fritz and Levine (1951) demonstrated that cortisone improves the sensitivity of "hyporeactive" vessels towards the effects of locally applied adrenaline (noradrenaline).

Hæmatological effects and reactions taking place in lymphoid structures of adrenalectomized rats and mice were presented at a meeting of the Australian and New Zealand Association for the Advancement of Science on August 26, 1952 (Hissink). It was demonstrated that the casein digest "Amparon" of Organon (Oss-Holland) induced significant degrees of eosinopenic responses in adrenalectomized rats and mice, while symptoms with increased disintegration of lymphocyte material were found in the lymphoid structures of adrenalectomized rats.

It is the purpose of this article to demonstrate hæmatological responses with eosinopenia in adrenalectomized rats and mice after the intraperitoneal injection of "Amparon".

Experimental Investigation.

The casein hydrolysate capain is no longer available in its original form, but is marketed by Organon (Oss-Holland) as "Amparon". In this preparation the hydrolysed protein material has been diluted to a 2·5% solution, and small amounts of sodium chloride (0·3%), glucose (3%) and potassium chloride (0·04%) have been added. The pH of the preparation is 6·0.

Rats were adrenalectomized under ether anæsthesia through a dorsal incision. Both adrenal glands were removed at one time, and the animals were afterwards kept in the heated animal house or laboratory. All experiments were carried out during the period between three and ten days after operation. Mortality among the rats was low provided the animals received proper food—pellets containing wheatmeal (19·5%), maizemeal (19·5%), pollard (19·5%), bran (6%), wheatgerm (6%), dry yeast (5%), ground limestone (1%), shark oil for vitamins *A* and *D* (1%), and salt (0·5%). Drinking water contained 0·9% sodium chloride.

Mice were adrenalectomized under ether anæsthesia, but through a median laparotomy incision. Both adrenals were removed at one time, and the animals were afterwards treated in the same way as the rats. However, among the mice there was a mortality of about 50% in the first two post-operative days.

Two strains of Wistar rats (weighing 100 to 250 grammes, black and white and white animals) were tested. White mice (adult animals weighing between 25 and 30 grammes) were used. While rats were used only once for each experiment, mice were tested repeatedly (between the third and tenth post-operative days). Experiments were carried out on non-fasting animals, as it is known that fasting in normal individuals and animals is often associated with a significant degree of eosinopenia in the peripheral blood, thereby reflecting a certain amount of stress (Bonner, 1952). Eosinophile cell counts were performed during the early afternoon, because spontaneous fluctuations in the number of peripherally circulating eosinophile cells with significant degrees of eosinopenia are known to occur during midnight and the early hours of the morning with a tendency towards eosinophilia during the early afternoon (Halberg and Visscher, 1951; Halberg, Flink and Visscher, 1951). It was also considered important to give the animals 0·9% sodium chloride in the drinking water, because salt deficiency seems to be associated with a reduction in the number of circulating eosinophile cells in intact animals (Danford *et alii*, 1951). Salt drinking water is also necessary because adrenalectomized animals lose large amounts of sodium. All reactions were studied when the animals were kept at a strictly controlled temperature (26° to 28° C.) and away from light.

Preliminary investigations indicated that black and white Wistar rats (females) were suitable animals for studies of "cortisone-effects" as reflected by eosinopenic responses after the injection of the drug into the peritoneal cavity of adrenalectomized animals. Cortisone was not available in sufficient amounts, and only three animals could be treated. The reactions may be studied in Figure I.

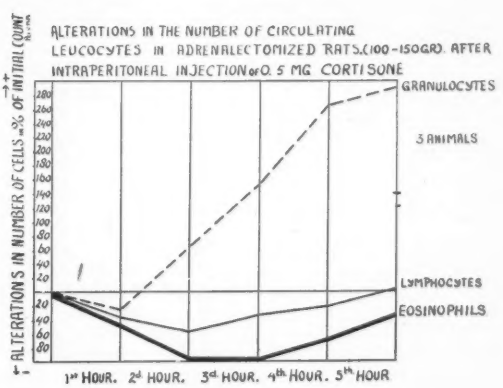
ALTERATIONS IN THE NUMBER OF CIRCULATING LEUCOCYTES IN ADRENALECTOMIZED RATS.(100-150GRO. AFTER INTRAPERITONEAL INJECTION of 0.5 MG. CORTISONE
ALTERATIONS IN NUMBER OF CELLS in % OF INITIAL COUNT
GRANULOCYTES
3 ANIMALS
LYMPHOCYTES
EOSINOPHILS
1st HOUR. 2d HOUR. 3d HOUR. 4th HOUR. 5th HOUR

FIGURE I.

It may be seen that eosinopenic responses were significant, with a maximum drop three to four hours after the injection, while lymphocytic responses were not so clear. With regard to the latter, it is known that the number of peripherally circulating cells is not under complete control of adrenocortical activities (Bacchus and Toompas, 1951; Dury, 1950; Ralli, 1946).

"Amparon" was tested in similar experiments and the results can be studied in Figure II. It appeared that black and white female Wistar rats reacted with eosinopenia with a maximum drop three hours after the injection of the casein hydrolysate. It may further be seen (Figure III) that adrenalectomized black and white Wistar rats, treated with adrenaline, showed no significant degrees of eosinopenia. Mice, which are known to be much more sensitive than rats to "cortisone effects" after adrenalectomy (Speirs and Meyer, 1949), received much smaller amounts of "Amparon" (absolutely and relatively). About 0·03 to 0·05 millilitre of the hydrolysate was injected per animal, while control mice received 0·005 milligramme of adrenaline in 0·5 millilitre of 0·9% sodium chloride solution.

In a number of the experiments eosinophile cell and leucocyte counts were performed at hourly intervals, start-

ing from one hour before the injections of the different drugs and continued until four or five hours after. In the majority of cases, however, only two counts were made, one before and one three hours after the injection. Eosinophile cell counts consisted of the average count of three different blood withdrawals. Blood was obtained from easily bleeding fresh tail wounds. Each new wound was made at a distance of at least one centimetre proximally from the foregoing one in order to avoid possible influences of thrombosis and blood clotting upon the number of eosinophile cells appearing in the tail veins (Godlowski, 1951). For this reason too, and because intravenous injections into the dorsal tail veins of rats are associated with a significant percentage of failures (70% reported by Griffith and Farris, 1942), neither "Amparon" nor adrenaline was injected by these routes. Tails were heated before wounds were made, and the first two droplets, which in most cases appeared spontaneously, were discarded. In a large number of rats it was necessary to induce some venous congestion by applying a slight pressure upon the two dorsal tail veins in the proximal part of the tail, and

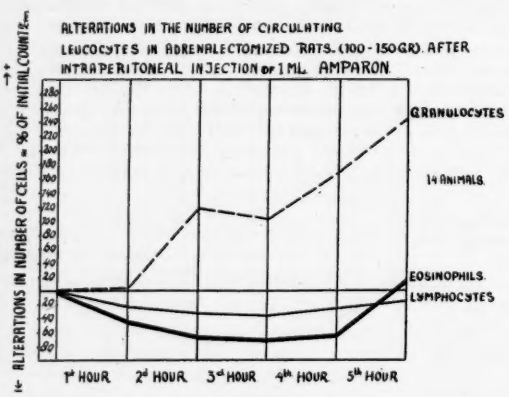

FIGURE II.

sometimes it was necessary to massage distal tail segments very gently to produce sufficient blood to fill three or four leucocyte pipettes to the 0·5 mark. "Amparon" animals and control animals were treated in exactly the same way, so that resulting "error factors", if present, would have influenced counts in both groups in a similar way.

Phloxine, 0·1% in 50% propylene glycol, was used as staining fluid, as recommended by Randolph (1944). Since sufficient information about relationships between eosinophile and non-eosinophile leucocytes is lacking, it was considered undesirable to use staining fluids in which non-eosinophile cells are destroyed to facilitate counting techniques. Three Levy counting chambers were used for each eosinophile cell count and filled from half-emptied leucocyte pipettes. These pipettes were wetted with the staining fluid before blood was sucked up to the 0·5 mark. The pipettes were then filled to the II mark with the staining fluid. Each pipette was shaken for not longer than forty-five seconds, until macroscopically the mixing was "complete" (Recant *et alii*, 1950). Counting chambers were filled with blood and staining fluid immediately after the shaking, and cell counting was begun about a quarter of an hour later under high magnification through a binocular microscope. Rats which showed initial counts with less than 100 eosinophile leucocytes per cubic millimetre were not used in the experiments. Counts of granulocytes and lymphocytes circulating in the peripheral blood were studied in blood withdrawn in a fourth pipette mixed in the usual way with Türk's fluid.

"Amparon"-injected and adrenaline-injected rats were studied simultaneously in groups of three to five animals each, a total of about 60 rats receiving "Amparon" injections, and 40 adrenaline injections. These 100 animals were divided into three groups and studied during different seasons. The first group, consisting of black and white Wistar rats (females), was tested during the months from September to November, 1951. The second and third groups, consisting of white animals, were studied during the colder months from April to August, 1952, while mice were tested during the warm summer months of December, 1951, and January, 1952.

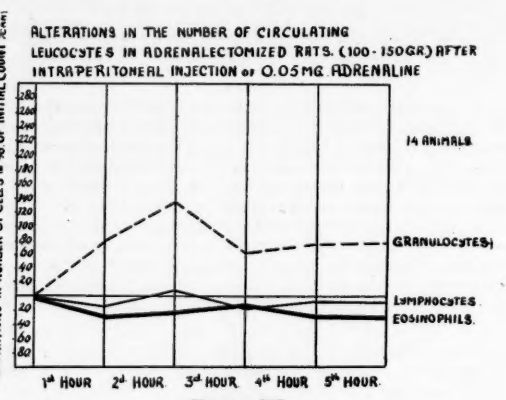

FIGURE III.

Results.

Figure IV shows the effects of "Amparon" and adrenaline in the first group of rats. Eosinophile cell responses are expressed as percentages of the initial counts three and four hours after the injection of adrenaline and four hours after the administration of "Amparon". It may be seen that seven out of the ten adrenaline-treated animals showed increases or decreases in the number of circulating eosinophile cells not exceeding a rise of about 100% or eosinopenic reactions of 40%. The picture was slightly different four hours after the injection, when seven rats reacted with alterations in the number of circulating eosinophile cells not beyond increases of 20% or drops of 30%. On both occasions, however, three rats, or 30%, showed quite significant degrees of eosinopenic responses with drops

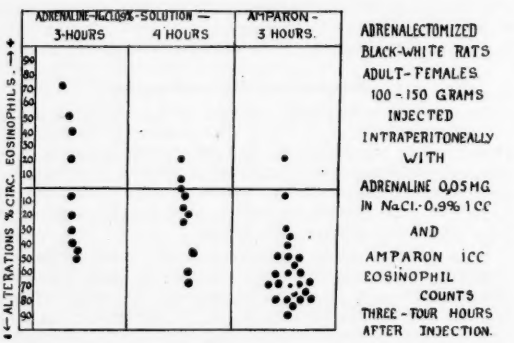

FIGURE IV.

ranging from 40% to 70%. While the majority of rats responded in accordance with reports in the literature (Recant, 1951; Speirs, 1951), the percentage of animals with large drops was significant. It may be that differences in environmental conditions interfered with the reliability of the counts, and it is possible that differences in the temperature of the animal house at night, when the temperature varied between 21° and 26° C., enhanced eosinopenic reactions. However, Figure IV shows that "Amparon" in such conditions induced much larger drops in the number of circulating eosinophile cells in a significantly larger percentage of animals than did adrenaline. About 85% of the 25 animals treated with "Amparon"

reacted with eosinopenia, with drops between 40% and 90%.

In the second group of white Wistar rats (female animals of 200 to 250 grammes), "Amparon" again produced pronounced eosinopenia three hours after its intraperitoneal injection into 13 rats (Figure V). Adrenaline, injected into 12 rats, induced about the same responses as those observed in the first group. The number of "control animals" showing significant degrees of eosinopenia was

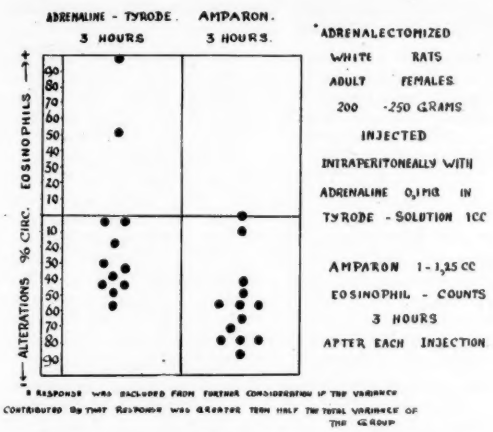
ADRENALINE - TYRODE 3 HOURS
AMPARON 3 HOURS
ADRENALECTOMIZED WHITE RATS ADULT FEMALES 200 -250 GRAMS INJECTED INTRAPERITONEALLY WITH ADRENALINE 0,1 MG IN TYRODE - SOLUTION 1CC
AMPARON 1 - 1,25 CC EOSINOPHIL - COUNTS 3 HOURS AFTER EACH INJECTION
+ ← ALTERATIONS % CIRC. EOSINOPHILS → -

FIGURE V.

larger than in the first group, in which about 30% of the animals reacted with eosinopenia. In this second group about 45% of the animals treated with adrenaline showed drops of between 40% and 60% in the number of circulating eosinophile cells. In 85% of the cases "Amparon" induced eosinopenia, with drops ranging between 40% and 90%, while in more than 50% of the cases it caused eosinopenic responses with drops beyond the 50% mark (adrenaline caused such drops in 16%).

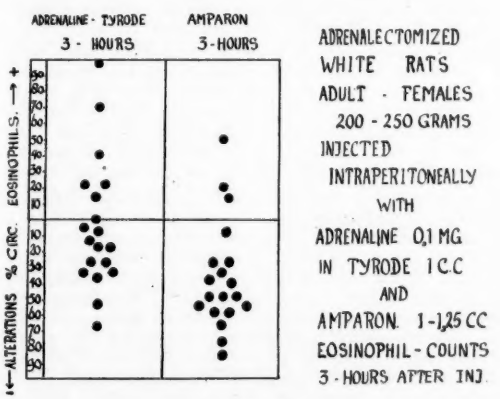
ADRENALINE - TYRODE 3 - HOURS
AMPARON 3 - HOURS
ADRENALECTOMIZED WHITE RATS ADULT - FEMALES 200 - 250 GRAMS INJECTED INTRAPERITONEALLY WITH ADRENALINE 0,1 MG IN TYRODE 1 C.C AND AMPARON 1 - 1,25 CC EOSINOPHIL - COUNTS 3 - HOURS AFTER INJ.
+ ← ALTERATIONS % CIRC. EOSINOPHILS → -

FIGURE VI.

To study the effects of temperature in reactions with alterations in the number of peripherally circulating eosinophile leucocytes, a third group of white female Wistar rats was kept in the laboratory under the strictly controlled temperature (26° to 28° C.) from before the adrenalectomy until the end of the experiments. The responses in these animals may be studied in Figure VI. In 19 of the 22 rats adrenaline caused eosinophilic or eosinopenic responses, but they never exceeded rises of about 100% or drops of 40%, and only 10% of the animals showed eosinopenic responses with drops between 50% and 60%. In 70% of the cases (19 rats) "Amparon" induced eosinopenic responses with drops of between 30% and 90%, while 55% of the animals reacted with drops of 50% and more. It seems, therefore, that in these experiments differences in temperature had some influence. They increased the chances of significant degrees of eosinopenic responses in animals which had spent the night in colder environments of the animal house (cold stress with tendency towards eosinophilic reactions).

The results were treated by the methods described by Fisher (1946) and the following statistics were obtained:

Group I:

Mean in control animals
= −20·4% ± 28·6% (standard error).
Mean in "Amparon"-treated animals
= −55·6% ± 24·5% (standard error).
$t = 3{\cdot}5$, $N = 33$, $P < 0{\cdot}01$.

Group II:

Mean in control animals
= −32·6% ± 18·2% (standard error).
Mean in "Amparon"-treated animals
= −57·3% ± 26·5% (standard error).
$t = 2{\cdot}52$, $N = 21$, $P < 0{\cdot}02$, $P > 0{\cdot}01$.

Group III:

Mean in control animals
= −4% ± 40·5% (standard error).
Mean in "Amparon"-treated animals
= −34·5% ± 34% (standard error).
$t = 2{\cdot}48$, $N = 36$, $P < 0{\cdot}02$, $P > 0{\cdot}01$.

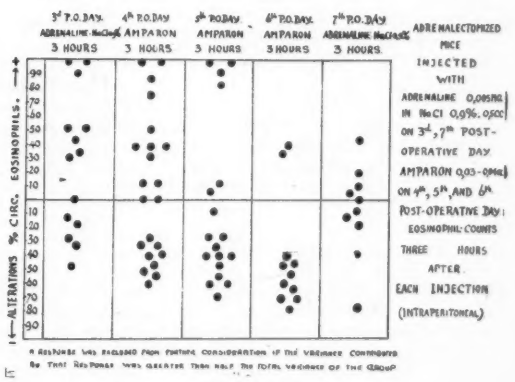
3 HOURS
3 HOURS
3 HOURS
3 HOURS
3 HOURS
ADRENALECTOMIZED MICE INJECTED WITH ADRENALINE 0,005 MG IN NaCl 0,9%. 0,5 CC ON 3rd, 7th POST-OPERATIVE DAY AMPARON 0,03 - 0,04 CC ON 4th, 5th AND 6th POST-OPERATIVE DAY: EOSINOPHIL COUNTS THREE HOURS AFTER EACH INJECTION (INTRAPERITONEAL)
+ ← ALTERATIONS % CIRC. EOSINOPHILS → -

FIGURE VII.

To give further support to the view that "Amparon" induced significant degrees of eosinopenic responses in adrenalectomized animals, the hydrolysate was also tested in 22 adrenalectomized mice. In these experiments adrenaline (0·005 milligramme diluted in 0·5 millilitre of 0·9% sodium chloride solution) was injected intraperitoneally into 14 mice on the third post-operative day. The results may be seen in the first section of Figure VII. Most of the treated mice reacted with significant degrees of eosinophilia. A small number of these animals showed eosinopenia with drops not exceeding the 35% mark. Only one mouse reacted with a drop of 50%, and this animal was marked. It reacted with significant degrees of eosinopenia, between 80% and 90%, in all tests.

On the fourth post-operative day "Amparon" was injected into 22 mice, and the responses may be studied in the second section of Figure VII. Although more mice showed a tendency towards greater degrees of eosinopenia than those seen after adrenaline injections, there was no significant eosinopenia. A second and third "Amparon" injection, on the fifth and sixth post-operative days respectively, increased this tendency. After the third injection about 80% of the surviving mice showed eosinopenia with drops of between 40% and 80%. Adrenaline, which was injected on the seventh post-operative day into the same animals, resulted in no significant eosinopenia in the large majority

of the mice. Only one mouse reacted with a drop of about 80%. Most animals (about 80%) showed reactions with alterations in the number of peripherally circulating eosinophile leucocytes fluctuating above and below the "zero line", not exceeding increases of 40% and drops of 30%. Statistics for the differences in reactions after the third "Amparon" and last adrenaline injections were as follows:

Group IV:

Mean in control animals
= −1·1% ± 23·5% (standard error).

Mean in "Amparon"-treated animals
= −43% ± 40·1% (standard error).
$t = 2·63$, $N = 18$, $P < 0·02$, $P > 0·01$.

These data indicate that, in adrenalectomized mice also, "Amparon" can cause significant degrees of eosinopenic responses when compared with control mice injected with adrenaline. Into these mice it was necessary to inject "Amparon" on three consecutive days, and a certain degree of cumulative effect was observed.

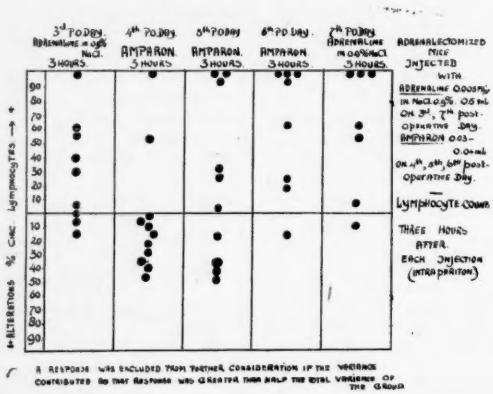

FIGURE VIII.

The effect of "Amparon", adrenaline and cortisone upon the number of other leucocytes circulating in the peripheral blood of adrenalectomized rats may be studied in Figures I, II and III, in which hourly responses after the intraperitoneal injection of the different drugs are recorded. All values are expressed as percentages of the initial counts made before the injections. It seems clear that there is some resemblance between the effects of cortisone and "Amparon", whereas adrenaline showed less significant degrees of granulocytosis and no lymphopenia at all. "Amparon", as did cortisone, produced a much more significant relative lymphopenia.

As already shown by the study of the eosinophilic responses, mice reacted slightly differently. Also they showed a tendency towards lymphopenia only after the first "Amparon" injection, which indicates that eosinophile responses do not run parallel with lymphocytic reactions. Lymphocytic responses may be seen in Figure VIII, lymphopenia being shown in the second section of this figure. The statistics for the differences in responses in the first two sections are as follows:

Group V:

Mean in control animals.
= +29·7% ± 36% (standard error).

Mean in "Amparon"-treated animals.
= −22% ± 15·6% (standard error).
$t = 3·78$, $N = 16$, $P < 0·01$.

Discussion.

It appears from the above-mentioned data that "Amparon" injected intraperitoneally into adrenalectomized rats and mice is able to induce significant degrees of eosinopenic responses in such animals, with a maximum drop about three hours after the administration. An explanation of the mechanisms concerned with such reactions may be suggested by the following.

1. The fact that rats and mice survive the loss of both adrenals, provided that they receive salt drinking water and proper food, indicates that the animals possess fairly satisfactory compensatory mechanisms. Such mechanisms are an important part of these studies and may be called "remnant adrenal functions", which may be stimulated more by "Amparon" than by adrenaline either directly or indirectly.

2. Pyrogens and bacterial polysaccharides may cause significant eosinopenic syndromes in adrenalectomized animals (Soylemezoglu and Wells, 1951). The "shock" syndrome, however, with the respiratory disturbances which characterize the condition of animals injected with bacterial endotoxins from the dysentery and typhoid groups, was not found after "Amparon" injections, even when large amounts (up to 15 millilitres) were used. Granulopenic responses, also characteristic after the injection of pyrogens and bacterial polysaccharides, were not found, but it is known that small amounts of such toxic substances do give rise to sustained granulocytosis (Poel and Belkin, 1952; Last *et alii*, 1950). "Amparon" is furthermore stated to be pyrogen-free, so that it is unlikely that "Amparon"-induced eosinopenia is due to mechanisms concerned with responses after the injection of pyrogens *et cetera*.

3. De la Balze *et alii* (1946) demonstrated that thiouracil may cause eosinopenia without alterations in the number of other circulating leucocytes. On the other hand, it has been postulated that the effects of ACTH and cortisone depend upon the presence of adequate amounts of thyroxine in the tissues (Long *et alii*, 1951; Hill *et alii*, 1952). Speirs and Meyer (1951) showed that certain toxic substances cause eosinopenia in adrenalectomized animals. It may also be that drugs such as nitrogen mustard *et cetera* have similar effects upon the white cells in the blood.

4. This concerns the well known reaction in adrenalectomized animals after the injection of adrenocortical extracts or cortisone (Recant *et alii*, 1950; Sayers, 1950). There is some support for the view that "Amparon"-induced eosinopenia in such animals shows a relationship to reactions observed after the injection of cortisone into adrenalectomized rats *et cetera*. The maximum drop in the "Amparon"-induced eosinopenia occurs in about the same order of time as eosinopenic responses in stress syndromes or after the injection of ACTH into intact animals. Cumulative effects of cortisone have been reported to occur in mice (de Andino *et alii*, 1951). Lymphopenia fits into this concept, but more investigations are necessary.

5. It is possible that "Amparon" reactions with eosinopenia in adrenalectomized rats and mice are due to quite different mechanisms. It is interesting to note that Harris and Lang (1952) reported eosinopenic responses after the injection of different amino acids into adrenalectomized rats. These amino acids, aspartic acid and glutamic acid, also induced lymphopenia in intact animals, but aspartic acid was also able to induce lymphopenia in adrenalectomized animals. Eosinopenic reactions after the injection of such amino acids into adrenalectomized rats were considered to be caused by mechanisms other than those involved after the injection of cortisone. This conclusion is not clear, because cortisone effects are known to be associated with catabolic processes in which certain proteins are involved. For that reason it may be that amino-metabolites are an important factor in these reactions. It is known that the concentration of free amino material increases considerably in certain tissues, such as adrenals and kidneys, during stress conditions or after ACTH and cortisone administration (Lee and Williams, 1952).

More information is necessary about the effects of amino material after its injection into living organisms, and studies on this subject are in progress.

Summary.

In these experiments the activities of "Amparon" in animals deprived of both adrenal glands were studied. The presence of cortisone-like activities in "Amparon" is suggested by the significant decreases in the counts of peripherally circulating eosinophile cells together with pronounced granulocytosis, but without lymphocytosis (sometimes with lymphopenia) and effects upon peripheral vessels.

Other reactions, depending upon remnant adrenocortical activities after bilateral adrenalectomy, and reactions after the injection of pyrogens and bacterial polysaccharides, are discussed.

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A REPORT ON AN INVESTIGATION OF A COUNTRY MIDWIFERY PRACTICE, WITH THE PRELIMINARY RESULTS OF 300 CASES FOLLOWING IMPROVED OBSTETRICAL CARE.

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Value of Stillbirth and Neo-Natal Statistics.

OBSTETRICS is one branch of general practice in which it is possible to obtain an accurate, complete and reliable index of the personal standard achieved by the individual practitioner.

Individual States and the Commonwealth as a whole annually publish the numbers of neo-natal deaths in the first week, first month and first year of life, together with stillbirth rates. Whilst these figures represent only the average rates they are worthy of close study, as they include all social groups and types of practice.

It would appear that the aim of the individual practitioner should be to better these results, as the true index of unavoidable mortality is probably at least half this average rate in our present state of knowledge. However, the lower the death rates fall, the more difficult it becomes to lower them still further, and the more numerous and thorough become the measures necessary to maintain the trend. Provided a reasonable standard of obstetrics is practised, the chief obstacle constantly encountered is the economic position of the patient, whose main concern in accepting good advice centres around such problems as the cost of suitable food, the provision of a housekeeper in her absence and the availability of the type of bed she can afford, suitable housing and various other factors. In the results under review, the country hospital has supplied sufficient low-cost beds, and the economic position of the patients has been good; but a considerable improvement in the handling of problems of ante-natal care has been necessary.

Lack of time and the small number of suitably trained personnel (radiographers, physiotherapists, supervising dietitians, almoners and social workers) severely handicap the general practitioner in his attempt to widen the scope of this work, and he has therefore to continue his present scale of ante-natal supervision, unless he is blessed with additional help.

Nevertheless, if the individual practitioners' stillbirth and neo-natal deaths per 100 cases are totalled, a valuable check can be obtained if they are compared with State and Commonwealth statistics, as the latter reveal that approximately 4% of all children born in the average are lost by either stillbirth or neo-natal death.

Tables I and II show a selection of these statistics, and indicate the steady fall in the number of deaths under the age of one year until 1951, when there was a rise in the

TABLE I.

Infant Death Rates, Metropolitan and Other, per Thousand Live Births (Under One Year).

Year.	New South Wales.		Victoria.		Queensland.		South Australia.		Western Australia.		Tasmania.		Australia.	
	Metropolitan.	Other.	Metropolitan.	Other.	Metropolitan.	Other.	Metropolitan.	Other.	Metropolitan.	Other.	Metropolitan.	Other.	Metropolitan.	Other.
1947	26·82	32·36	26·82	25·57	34·59	28·70	20·73	28·91	26·99	35·18	31·52	25·56	27·21	29·73
1948	26·96	33·00	23·77	24·12	29·94	26·89	28·67	31·10	22·59	28·78	23·39	29·33	26·08	29·24
1949	25·19	28·91	19·97	24·27	21·38	26·55	26·11	29·64	21·52	31·57	26·21	23·00	22·94	27·33
1950	25·44	28·18	19·13	21·20	31·98	22·37	24·68	23·25	25·41	28·83	23·29	23·96	23·82	24·98
1951	22·89	28·57	20·66	24·78	26·83	25·04	22·45	27·09	26·38	30·84	26·37	26·75	23·00	26·98

Commonwealth figures and in all State figures. This rise may be only temporary, but indicates the need for avoiding complacency. A gradual fall has also occurred in the stillbirth rate in all States, but the latter and the deaths in the first year should be studied together to give a true indication of the fall in figures. New South Wales has a lower stillbirth rate but a higher neo-natal death rate than Victoria, the result being approximately equal combined results for both States.

The metropolitan figures are in most instances superior to the country results, particularly those relating to the deaths under one year, with the exception of South Australia's stillbirths in 1952, and the Tasmanian figures for 1948 and 1950.

It was with the high country figures in mind that the previous 100 confinements which I conducted were reviewed, and the results were average for Western Australia. A review of the nursing, ante-natal and labour ward practices was undertaken, and a further review was carried out in the succeeding 100 cases (approximately one year intervals).

The results of the measures taken to correct the defects discovered are outlined in Table III, in which the incidence of important complications shows a satisfactory fall. If the 1948 Western Australian figures are used as a standard, the expected mortality is 13·5 compared with the observed mortality of 6·0. Such a deviation from expectation would occur by chance with a frequency of only 1·73%, so the result is adjudged significant. However, it is thought that the accumulation of another 200 cases is necessary to conform the trend in mortality.

Defects Discovered.

The investigation of the methods used by myself and the hospital revealed the following major defects that could be remedied.

1. Poor preventive management of toxæmias of pregnancy.

2. Insufficient visiting of the patients in hospital during labour.

3. Inadequate examination of the patient in labour. Vaginal examinations were made too infrequently, and too much reliance was placed on rectal examinations. In one case ergot was given intravenously following the birth of the first twin (the presence of the other twin being undiagnosed). The patient complained of a severe cramp-like pain and within two minutes gave birth to the second twin. This could have been serious, but fortunately resulted in no harm to mother or child. In another case, before forceps were applied in a delayed labour, a large dermoid cyst presented, in which the teeth were easily palpable. This had been undiagnosed at the initial ante-natal visit. On this occasion the cyst was able to be pushed above the head before forceps were applied.

4. Too hurried surgery consultations in ante-natal visits, resulting in infrequent hæmoglobin estimation.

5. Inadequate and insufficient X-ray examinations to check difficult abdominal findings; infrequent X-ray examinations of the chests of patients with prolonged upper respiratory symptoms.

6. Inadequate ante-natal practice in fœtal heart counts. This also applied to the accuracy and frequency of their estimation in the labour ward. One stillbirth may have resulted from the tardy application of forceps when fœtal heart estimation was not carefully carried out.

7. Inadequate inquiry into the cause of all stillbirths and neo-natal deaths. No post-mortem examinations were performed, nor were the notes on the cause of death adequate for future reference.

8. The placing of *primaparæ* in the labour ward hours too early in the first stage, instead of their being allowed to walk about or rest in their own bed, where the atmosphere was more congenial.

9. Some important and consistent weaknesses in the hospital routine, which, however, on the whole was satisfactorily carried out by the nursing staff. (*a*) Resuscitation facilities and routine were poor. There was an insufficient appreciation of the importance of early and adequate administration of oxygen in cyanosis, particularly during the first half-hour after delivery. (*b*) Too much responsibility was given to untrained staff. (*c*) Insufficient attention was paid to full bladders when the patient was unable to pass urine during the second or third stage. (*d*) Poor equipment was available for the care of the obviously premature infant. There appeared no alternative but to transport this type of infant, if it seemed likely to survive the 150-mile drive to Perth.

10. Inadequate isolation routine and particularly facilities in the case of infant infections in the baby ward.

TABLE II.

Stillbirth Rates per Thousand Total Births.

Year.	New South Wales.			Victoria.	South Australia.	Western Australia.			Tasmania.		
	Metropolitan.	Country.	Whole State.	Metropolitan.	Whole State.[1]	Metropolitan.	Country.	Whole State.	Metropolitan.	Country.	Whole State.
1947 ..	18·99	22·1	20·6	22·0	—	22·7	23·3	23·0	23·6	27·0	25·52
1948 ..	18·23	20·2	19·3	21·9	—	20·0	20·2	20·1	27·4	23·2	25·0
1949 ..	17·40	18·9	18·2	20·9	—	16·9	22·1	19·4	19·6	23·6	21·9
1950 ..	18·87	19·5	19·2	21·9	—	—	—	16·6	18·9	18·5	18·7
1951 ..	15·91	18·7	17·6	21·5	—	—	—	19·2	22·9	21·4	22·1
1952 ..	(Approximate only)		17·5	—	17·5	—	—	18·0	15·1	22·1	19·1

[1] South Australia's 1952 figures show a lower country rate (16·8) than metropolitan (17·5).

TABLE III.
Incidence of Complications.

Series.	Still-births.	Neonatal Deaths.	Cæsarean Sections.	Forceps Delivery.	Episi-otomy.	Versions.	Manual Removal.	Toxæmia.	Early Hospital Admission (Toxæmia).	Morbidity.	Breech Presentation.	Twins.
First 100 ..	4	—	1	11	10	16	2	7	—	10	1	1
Second 100 ..	—	2	1	4	20	23	1	3	4	11	3	1
Third 100 ..	—	—	2	1	22	23	2	3	9	6	1	1
Total ..	4 (1·3%)	2 (0·66%)	4 (1·3%)	16 (5·3%)	52 (17·3%)	62 (20·7%)	5 (1·7%)	13 (4·3%)	13 (4·3%)	27 (9·0%)	5 (1·7%)	3 (1·0%)

Measures Taken to Reduce Fœtal Mortality.

Patients Needing Consultant Care or Advice.

Although all patients in the 300 cases under review were booked in and delivered locally, it was decided to send away any with complications demanding the extra facilities and the liaison of obstetrician, physician and pædiatrician.

On eight occasions use was made of the telephone to seek the consultant's advice; great care was taken to get reliable facts to avoid misleading the patients. A rule was made that the consultant's advice be taken in each case. This policy was successful on each occasion despite temporary doubts. Four other patients with breech presentations were sent for version and returned for normal deliveries.

TABLE IV.
Causes of Stillbirths[1] and Neonatal Deaths.

Case Number.	Cause of Stillbirth or Neonatal Death.	Remarks.
I	Obstructed labour.	*Primipara*, forceps delivery, stillbirth (40 weeks).
II	Syphilis.	*Primipara*, death *in utero* (30 weeks). Positive reaction to Wassermann test.
III	Pre-eclampsia.	*Primipara*, forceps delivery, death *in utero* (40 weeks).
IV	Chronic nephritis.	*Multipara*, accidental hæmorrhage, death *in utero* (28 weeks).
V	Accident to *multipara*.	Premature labour (29 weeks); death in one hour, atelectasis.
VI	Pneumonia in *multipara*.	Premature labour (32 weeks); death in twenty-four hours, atelectasis.

[1] The old term "stillbirth" instead of the newer term "fœtal death" has been retained for this article.

Certain constitutional illnesses and abnormalities complicating pregnancy are generally regarded as making the patient unsuitable for delivery in a small country hospital, the major indications including active tuberculosis, syphilis, poliomyelitis, moderately severe to severe heart disease, severe to moderately severe diabetes, thyrotoxicosis, psychosis, severe maternal pelvic deformities, the presence of triplets (unless special staff is available), fœtal monsters previously diagnosed and needing destructive methods for vaginal delivery, and Rh incompatibilities. As the sum total of patients presenting these complications is still a very small fraction of the total number of patients treated, insufficient experience and inadequate facilities appear to make it imperative to resist one's vanity and any personal pleadings on the part of the patient; she should be immediately referred for specialist attention, if better maternal and fœtal mortality results are to be obtained. However, no patient in this series was referred for constitutional disease.

The Labour Ward Routine.

Patients were examined on their admission to hospital, stress being placed on reassurance and on relaxation of the patient in the manner in which she had been instructed. *Primiparæ* were examined at approximately four hourly intervals during labour, but were left in the wards, given no sedative initially, and encouraged to walk about and forget their pains, and not moved into the labour ward until as late as possible.

Vaginal examinations were carried out more frequently, although the rectal route was the usual method preferred. The members of the staff were instructed not to leave the patient except for short intervals, and to deliver the head if unexpected progress occurred, rather than hold the progress until the late arrival of the medical attendant. Extreme conservatism was observed in the application of forceps, and the patients responded well in difficult cases, provided one was willing to stand by them during the latter part of the second stage. This conservatism demanded care in fœtal heart estimations, and resulted in a considerable number of prolonged stays at the bedside. One difficulty constantly encountered was the premature bearing down of the patient, usually soon after three-quarters dilatation of the cervix. The patients were encouraged not to bear down until as late as possible, in an attempt to diminish the incidence of fatigue and of post-partum cystoceles *et cetera*. Many patients insisted on bearing down early in the first stages, often owing to the fact that they had been incorrectly instructed in a previous labour. Few patients considered their pains merely contractions, and the word "pain" was used in the labour ward. The erect squatting position during the second stage was abandoned owing to the anxiety of the staff in following the progress of the head. The supine squatting position was found satisfactory, provided the patient had assistance in holding her knees in position.

A minimum of three nurses was found to be essential in forceps or breech deliveries, to allow adequate supervision of anæsthetic, fundus, episiotomies, resuscitation of the baby and emergency supplies.

Poor asepsis was found to be usually due to myself, the staff setting a good example. Of the patients 9% had temperatures above 100° F. on on one or more occasions. No progress was made in elucidating the causes accurately, but no immediate remedy can be seen until bacteriological control can be instituted. However, care was taken to maintain high hæmoglobin levels, and penicillin was given in cases of likely infection, rather than as a routine measure in any manipulative delivery.

Ante-Natal and Post-Natal Care.

Particular care has been taken in the ante-natal surgery consultations. Increasing numbers of patients with early toxæmia were admitted to hospital, and the hæmoglobin value was estimated more frequently.

Poor radiological facilities necessitated the raising of £2600 to purchase a new 100-milliampere unit, the Public Health Department and the local townspeople each contributing £1300. This has already provided an invaluable check on malpresentations, and frequent X-ray examinations of the chest of patients and occasionally of the newborn. Our aim is to examine the chest of every patient radiologically. The introduction of adequate ante-natal training has resulted in a changed atmosphere in the labour ward, with a lower forceps delivery rate, minimal sedation and less fear in the patients. A detailed account of the exercises is not within the scope of this article, but the following principles are carried out.

1. Each patient is instructed by the physiotherapist in the physiology of labour and is given a copy of Helen

Heardman's booklet, "Relaxation and Exercises for Natural Childbirth".

2. Patients formerly trained in groups are now treated individually, with a pronounced improvement in results.

3. Sufficient visits are allotted to ensure that the instructions are carried out automatically, despite the stress of labour.

4. For the first stage of labour, the patients are instructed in breathing exercises combined with various positions of relaxation, and are told to avoid lying on their back. The second stage instruction includes the timing and method of bearing down.

5. Post-natal exercises are commenced on the day of delivery or as soon as possible.

It appears that these ante-natal and post-natal exercises have played a major part in the reduction of complications, for example, in the last 200 cases, in which the forceps rate alone was under 3%. They have proved very popular with the patients, and of considerable assistance in dispelling their fears and misconceptions. The patients appear to tell the physiotherapist more of their worries and problems than they tell the medical attendant, and much valuable information is continually handed back by the physiotherapist.

The low forceps delivery rate has resulted in an acute unfamiliarity with forceps on my part when I have applied them, and to date I cannot decide whether a premature baby will do better with a normal delivery or with a forceps delivery, when I am relatively out of practice in the manœuvre.

Ante-Partum and Post-Partum Hæmorrhage.

All patients have their blood Rh typed; batches of 14 patients are brought to the surgery at intervals, and the blood specimens are sent through the post to the Public Health Laboratories. Despite some initial packing difficulties, this method has proved far preferable to the initial Rh typing locally, which proved unreliable on two occasions.

In view of the absence of any blood bank, blood is taken from local donors (usually two pints) in anticipation of need, whether the blood is used or not. Transfusions have been given on eight occasions in 300 cases, and two pints only have been thrown away. Blood is taken as a routine measure for moderately severe ante-partum hæmorrhages and Cæsarean sections.

The absence of a blood bank is a major factor in the type of management used in the third stage. If the patient has lost one point of blood and is still losing from a partially separated placenta, immediate plans are made to carry out a manual removal.

Ergot has been given intravenously at the end of the second stage in approximately 150 cases. The average blood loss has been greatly reduced, but with an increased rate of incomplete expulsion of membranes, and an unchanged manual removal rate. Until a more suitable method is evolved, no change is contemplated in the routine intravenous use of ergot at the end of the second stage, in view of the probably increased maternal safety from diminished blood loss. Dr. W. K. McIntyre, of Launceston, kindly supplied full details of his method of saline injection of the cord; this was used successfully in three cases prior to the introduction of the intravenous use of ergot, but has not been needed since the latter was introduced.

Initially, when the mother was Rh-negative, the husband was brought in for blood grouping. This measure resulted in great anxiety to Rh-positive husbands, so the practice was discontinued in favour of Rh-negative mothers having routine blood samples taken at the thirty-sixth week. To date no patients have needed transfer to a suitable centre.

Breech Deliveries.

It has long been established that version performed during ante-natal visits has been associated with a considerably lower fœtal mortality than has breech delivery. Version was performed once in every five cases, and breech presentation was the commonest single abnormality encountered during ante-natal visits. In four *primiparæ* version was unable to be accomplished, and on each occasion they travelled 150 miles to a consultant, who accomplished version under anæsthesia. Each patient was radiologically examined before being sent to Perth, to avoid errors. In view of the infrequency of version under anæsthesia, it was deemed advisable to leave this to the better judgement of the consultant. Despite the attempt to eliminate breech delivery completely, mistakes in diagnosis occurred in relation to four *multiparæ* (*plus* one case of twin pregnancy). No fœtal loss occurred.

These four cases posed a problem that appears difficult to solve. How does the young obstetrician in general practice get sufficient experience in breech deliveries? Despite the fact that the Lovsett manœuvre makes extended arms considerably easier to deal with, extreme uneasiness and lack of confidence were felt during these deliveries. At the present rate of incidence it does not appear likely that one would ever become really skilled in dealing with the abnormality. This comment applies equally to forceps deliveries. The incidence of forceps deliveries in 200 cases (five) is comparable with the Cæsarean section rate (three); perhaps the increasing accentuation of forceps delivery for premature infants will result in a higher incidence in subsequent series, but the problem of insufficient practice in breech deliveries remains.

Anæsthesia and Sedation.

A full circle since I commenced practice has been accomplished in the choice of anæsthetic. Chloroform was first used, a change was made to ether and after that "Trilene" was hailed with enthusiasm. Despite the view that ether was safe in the hands of unskilled nurses, much anxiety has been experienced with patients vomiting during induction of anæsthesia, and the use of chloroform has been resumed.

Chloroform is avoided if its use is obviously contraindicated, and the amount administered is watched as well as circumstances permit, with an erring on the side of too little.

Episiotomies have been performed on an increasing scale to speed the delivery, repair under local anæsthesia being regarded as preferable to reinduction of general anæsthesia.

The increasing training in anæsthesia given to midwifery sisters will result in a diminution of one of the most important maternal risks in otherwise uncomplicated deliveries.

Sedatives have been reduced to a minimum, twilight sleep having been abandoned. The average *primipara* requires 100 milligrammes of pethidine near the end of the first stage and occasionally bromides or "Nembutal" during the early first stage when sleep is required.

Hypnosis has been successfully undertaken in two cases, but in a busy practice its use does not appear practical as a routine procedure, in view of the time necessary to train patients in the method. However, it is hoped to use the method in selected cases more frequently than in the past.

Neo-Natal Problems.

Some limited progress has been made in dealing with difficulties in the neo-natal period.

Consultant Advice in Serious Cases.—Any baby seriously ill was immediately taken by motor-car or ambulance to a consultant, and if death occurred a post-mortem examination was carried out. All babies (eight) taken 150 miles in such a fashion have been unaffected by the journey and appear to travel well. The specialized staff needed in the care of these babies makes the problem difficult in a small hospital. The parents naturally appreciate a second opinion, but the main value is the discussing of the case with the consultant, and the facing of any possible mistakes committed in the management of the newborn.

The Purchasing of an Incubator.—The standard of care given to the premature infant varies considerably, and past records reveal that babies weighing under three pounds

have too high a mortality whatever the causes. No effect on the mortality can be obtained for some years with the particular equipment bought, which cost £250; but the management is enormously simplified in a small hospital. It is believed that incubators are essential if the results among premature babies are to be improved. The two neo-natal deaths in this series would possibly have been preventible if an incubator had been available at the time.

Other Measures.—Greater care is taken over the oxygen requirements of and the removal of mucus from the newborn. All babies are given postural drainage for some hours after delivery. The staff have repeatedly stated that the babies are "more mucousy" when treated in this fashion. However, no idea can be given as to the effect on pneumonia, as the incidence over this series of cases and in previous years has been negligible.

Great difficulty has been experienced in controlling nursery infections. Dr. Kate Campbell kindly gave her advice on the measures necessary in combating them, particularly in regard to the laundry routine. However, the problem appears to recur continually, and no real progress has been made in reorganizing the nursery laundry, as the continual change of staff (domestic and nursing) makes supervision difficult. Isolation facilities for any affected baby are inadequate, and minor outbreaks of conjunctivitis and impetigo continue to occur.

The preliminary results in this series, together with a brief analysis of larger series of cases, suggests that a considerable decline in the stillbirth rate can be expected, but the lowering of the neo-natal death rate will be more difficult.

Methods Evolved to Overcome Sociological Difficulties.

The overcoming of sociological difficulties was found to be a most difficult field in which to effect any improvements. In regard to toxæmia and hospital costs a firm stand was taken. The main difficulty lay in stressing the importance of hospital treatment to the patient; once patients had realized this, they usually found help elsewhere. Poor housing and cramped living conditions were improved in a number of cases. Each *primipara* was asked whether she had her own home, and, if not, what she intended doing about it. Some patients were unaware of financial assistance available to them or how to go about financing a home, and were then directed to bank managers and real estate agents. Improved living quarters were found for a few other patients.

Too few patients were able to find adequate housekeepers, the most important single worry to all patients entering hospital unexpectedly. It appears that better results would be obtained if doctors made personal contact with the available bureaux in an urgent case, rather than leaving it to the patient armed only with a vague certificate of ill health.

Dairy farmers were attacked for permitting their wives to work in the cowshed—a constant source of worry. One seven months premature labour, caused by the wife's turning the milking engine, resulted in a neo-natal death. Other patients narrowly avoided premature labour through similar misdeeds. Husbands were also attacked about the lack of facilities in the home when they were buying a new motor-car *et cetera*. Moderate success was observed in some cases, but the dairy farmer in too many instances did not realize how much work he expected of his wife. If he did realize it, his course of action lay in doing very little about it.

Summary and Conclusions.

The value of studying selected Commonwealth and State stillbirth and neo-natal mortality figures is discussed.

Approximately 4% of all infants born in 1951 died before the end of one year, either by stillbirth or otherwise. The metropolitan figures in most instances are superior to those of the country.

An inquiry was conducted into the methods used by myself and the Busselton hospital, and the resulting defects are summarized.

The incidence of complications in the 300 cases following the inquiry shows a satisfactory fall, the incidence being 2% combined stillbirth and neo-natal mortality; six deaths occurred in the series, compared with an expected 13·5 on 1948 figures.

The measures taken to reduce the mortality include the laying of stress on the problems peculiar to the country in ante-natal care, labour ward routine, anæsthesia, breech presentations, ante-partum and post-partum hæmorrhage, the obtaining of a consultant's advice and sociological difficulties. Particularly good results have been achieved with ante-natal exercises and reeducation, and conservatism.

The advantages of new equipment in the form of a 100-milliampere X-ray unit and an electrically controlled incubator are outlined.

It is hoped that the steady improvement in the measures taken will maintain the low stillbirth rate; but more difficulty is expected in lowering the neo-natal death rate, as most of the problems in the latter field remain essentially unsolved.

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ANALYSIS OF AMINO ACIDS PRESENT IN BIOLOGICAL MATERIAL BY CHROMATOGRAPHIC METHODS SUITABLE FOR ROUTINE CLINICAL USE.

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INVESTIGATION of the amino acid content of biological fluids has, until recently, been handicapped by the difficulty of finding suitable methods of differentiation. Some of the more complex amino acids can be estimated colorimetrically, but it is difficult to determine the concentration of the simpler members in this way. The use of isotopic dilution followed by separation can be carried out only under special laboratory conditions, while microbiological assay is likely to be affected by other substances normally present in biological material, and in any case varies with the ratio of optical isomers present.

With the development of partition chromatography, and of paper chromatography in particular, a method became available which separates the majority of the amino acids, uses very small quantities of material and requires only simple apparatus. Such a method is obviously of value in biological work, in which only small amounts of material are available. In 1948 Dent published his paper on the behaviour of 60 amino acids on paper chromatograms using phenol and collidine as solvents, and since that time numerous other reports have appeared on the use of different solvents and colour reagents for the separation and detection of amino acids in different fluids. From the clinical point of view, however, much of the work has been on the rather more obvious conditions such as the amino acidurias (cystinuria, Fanconi syndrome, phenyl ketonuria, gross liver damage *et cetera*), so that a very large field has still to be explored before the full value of the technique to clinical medicine can be assessed.

Much of the earlier work on amino acidurias was carried out on large sheets of chromatography paper (18 inches by 20 inches in area) and with the use of phenol and collidine

[1] In receipt of a grant from the National Health and Medical Research Council.

and lutidine mixtures as solvents, or with strips of paper and solvents such as butanol acetic acid. The former method gives excellent two-dimensional separation of amino acids, but is cumbersome to handle and uses large amounts of solvents. The latter does not give very clear separation of amino acids, although it will show whether gross amino aciduria is present or not.

In 1950 Datta, Dent and Harris designed an aluminium rack which will hold a dozen papers 20 centimetres square, and this size is found to allow reasonable separation of those amino acids normally found in serum and urine, although it is not as good as that obtained with the larger papers. However, the apparatus has the advantage that a dozen papers can be examined at one time with apparatus which is cheap and convenient to handle and does not take up much room. For routine investigations the degree of separation of the amino acids is quite satisfactory, and if necessary the more refined methods can then be used for special investigations.

The purpose of this paper is to record our experiences with the use of this procedure, together with information on solvents, staining, recording results, and modifications of the usual methods to suit Australian conditions. Further particulars about the use of other solvents and the separation of other substances (for example, sugars), preparation of micropipettes *et cetera* can be obtained from the article on chromatography by Dent (1951).

Technique and Methods.

Apparatus and Solvents.

Owing to the difficulty of obtaining adequate supplies of collidine and lutidine (the usual solvents for two-dimensional amino acid chromatograms) from overseas, some time was spent in trying to find some other suitable solvent. Butanol and water, and butanol, acetate and water, were not found to be satisfactory for use with two-dimensional chromatograms. After careful testing it was found that with 80% aqueous ethanol as the first solvent and water-saturated phenol as the second, a good separation of those amino acids normally present in serum and urine could be obtained. In addition to its ready availability, the use of ethanol has the advantage that it is a far pleasanter substance to handle than lutidine or collidine, and does not require the use of a draught cupboard.

An aluminium rack which would hold 12 papers 20 centimetres square was made according to the directions given by Datta, Dent and Harris (1950). The solution to be examined was placed in one corner of the paper square in five microlitre portions, each of which was dried with a hair drier before the application of the next portion, so that the final diameter of the spot was kept as small as possible. Whatman number 1 and number 4 papers were used, but it was soon found that the solvent travelled faster on number 4 paper and that the amino acid separation was just as satisfactory, so that this paper was used for all subsequent tests. The rack containing a dozen papers was placed on a shallow tray (containing the solvent) in a glass trough with the papers in the vertical position. The trough was covered with a glass plate so that it was air-tight. The solvent was allowed to rise up the papers by capillary action until it reached the top. The rack was then removed, and the papers dried thoroughly, turned through an agle of 90° and then replaced in the trough on a tray containing the second solvent, and the second run was carried out in the same way. After being dried, the papers were dipped in a solution of 0·1% ninhydrin in acetone, and the colour was developed by heating the papers to 100° C. Up to the present this has been done by the judicious use of radiators, but an oven would be more satisfactory. Though dipping the papers in ninhydrin uses a little more reagent, it is far more convenient than the usual practice of spraying with ninhydrin in butanol (neither spray plant nor fume cupboard is then necessary) and gives a more even colour development.

Cost.

The approximate cost of the apparatus is as follows: aluminium rack, £2; glass trough, £7; hair drier, £5; enamel tray for solvent, 10s.; drying oven, £45. Approximately 80 runs can be made with one pound of phenol, and 100 papers stained with one gramme of ninhydrin.

Amino Acid "Maps".

Because ethanol (80%) is not a solvent commonly employed in chromatography, it was necessary to prepare amino acid "maps" showing the relative position of the more important amino acids after the two-dimensional chromatograms have been run by the use of five to 20 microlitres of 0·01 molar solutions of the amino acids. The position of the following amino acids (or their derivatives) was determined: glutathione, ornithine, cysteic acid (from cystine), aspartic acid, glutamic acid, glycine, serine, taurine, threonine, alanine, tyrosine, leucine, methionine, valine, α-amino-butyric acid, γ-amino-butyric acid, phenyl alanine, proline, oxyproline, β-alanine, tryptophane, histidine, methyl histidine, glutamine, asparagine, citrulline, arginine and lysine. Not all these amino acids can be distinguished on a single chromatogram, but by running several squares each with five or six amino acids, the relative position can be determined. A further means of identification is the colour produced with ninhydrin, which in some cases is quite characteristic—for example, pink with glycine, grey with histidine, green with methyl histidine, brownish-red with aspartic acid *et cetera*.

Some difficulty was experienced in locating the position of α-amino-N-butyric acid, which was believed to be present in some specimens of urine. On theoretical grounds it would be expected to lie between alanine and valine and to give about the same amount of colour with ninhydrin. The initial test with the use of one sample gave a very weak spot lying well above alanine and almost in line with valine. The experiment was repeated with a sample from a different firm, which gave roughly ten times the depth of colour with ninhydrin and lay between alanine and valine in the expected position for α-amino-N-butyric acid. It was therefore concluded that the former sample was not α-amino-N-butyric acid as stated on the label.

The basic amino acids arginine and lysine do not separate clearly with these solvents, but appear more often as streaks rather than as discrete spots. Efforts to improve this were made by adding pyridine in varying proportions to the ethanol and by using diethylamine vapour, but although some improvement was obtained it did not warrant the extra work involved. Adjustment of the specimen to pH 3·0 before spotting did, however, produce a reasonable differentiation of these amino acids.

Estimation.

Since the colour produced by ninhydrin with amino acids fades after a few days, no permanent chromatogram can be kept. An approximate estimation of the amount of each amino acid present on the chromatograms was made by assigning a number to each spot according to the depth of colour produced. It was felt that for clinical purposes minor variations in the amino acid content would be of little significance, and that this rather crude method of estimation was therefore quite adequate.

Urine Analysis.

Single specimens of urine were obtained for analysis and the total nitrogen content was measured by the micro-Kjeldahl method. An amount of urine containing 250 microgrammes of nitrogen was applied to the paper in six microlitre lots. To demonstrate the presence of cystine, which decomposes during the run, 0·25 millilitre of urine was oxidized with 0·1 millilitre each of ammonium molybdate (0·1%) and peroxide of hydrogen (30%) in order to convert the cystine to the more stable cysteic acid. A second chromatogram was then run, equivalent amounts of this oxidized urine being used.

TABLE I.

Amino Acids in Urine and Serum of Normal Women.[1]

Number of Cases.	Material.	Lysine.	Leucine and Methionine.	"A."	Tryptophane.	Cystine.	Histidine.	Glutamine.	Valine.	Alanine.	Threonine.	Taurine.	Serine.	Glycine.	Glutamic Acid.	Aspartic Acid.	Total Amino Acid.
11	Urine ..	0 to 2 (0)	0 to 1 (0)	0 to 3 (2)	0 to 1 (0)	1 to 3 (3)	1 to 5 (3)	2 to 5 (4)	0 to 3 (1)	1 to 3 (3)	0 to 2 (1)	0 to 5 (3)	2 to 6 (5)	3 to 8 (5)	0 to 3 (2)	0 to 1 (0)	13 to 37 (29)
12	Serum ..	0	0 to 3 (0)	0	0 to 1 (0)	0	1 to 3 (1)	3 to 5 (4)	1 to 3 (2)	2 to 5 (4)	0 to 1 (0)	0 to 3 (1)	1 to 5 (3)	2 to 3 (2)	0 to 3 (2)	0 to 2 (1)	16 to 25 (21)

[1] Expressed in terms of intensity of colour with ninhydrin; average value in parentheses.

In earlier work amino acid spots were identified by the addition of known amino acids to the test material, and this procedure is still used when there is any doubt about the identity of a particular spot. So far only one unidentified spot (spot "A") has been found to occur not infrequently in normal urine. It is not affected by acid hydrolysis and is therefore not a di-peptide or tri-peptide. It is hoped to identify "A" at a later date.

Under these conditions specimens of urine from normal subjects showed the presence of glumatic acid, cystine, glycine, serine, alanine, glutamine and histidine, and sometimes of aspartic acid, taurine, threonine, valine, lysine, tryptophane and "A". In cases of amino aciduria, not only was there an increase in the concentration of these amino acids, but methyl histidine, arginine, asparagine or leucine was sometimes detected. The average values and normal range are shown in Table I.

Serum Analysis.

Protein was precipitated from serum by the addition of an equal volume of acetone and separated by centrifugation. The supernatant was placed on the chromatography paper in amounts equivalent to 62·5 microlitres of serum and the chromatogram was developed in the same way as for urine. By this means normal serum was found to contain aspartic acid, glumatic acid, glycine, serine, alanine and glutamine, and sometimes taurine, threonine, valine, tyrosine, leucine or histidine. The average values and normal range are shown in Table I.

Results.

During 1952, 3500 amino acid chromatograms have been run by the use of these methods. The majority of these have been for special research investigations, the results of which are to be reported later. However, as the results of few investigations of this nature have as yet been reported, as wide a variety of conditions as possible has been examined and some of the results are reported here. A larger number of cases of each condition must be examined before any definite conclusions can be reached; but it was thought that the following results, even though largely of a negative nature, were worth recording.

Effect of Diet on Serum and Urinary Amino Acids.

It is known that during protein digestion there is a small rise in the amino nitrogen content of serum. It was therefore possible that the consumption of a protein-rich meal immediately before the collection of the serum might alter the amino acid chromatogram. Specimens of blood and urine were therefore collected from two normal subjects twelve hours after the last meal and again three and seven hours after the consumption of a meal containing approximately 20 grammes of protein mainly as eggs and milk. Chromatograms showed that there was some increase in the amount of some amino acids present in both serum and urine after the consumption of the protein, but the differences were small and no unusual amino acids were detected. By giving arbitrary figures for the amount of each amino acid present according to the depth of colour produced, it can be seen from Table II that the overall increase in amino acids was very small in serum and somewhat larger in urine, but was still within the normal range.

These differences were not considered to be sufficiently great to warrant careful dietary control before collection of specimens for analysis. Nevertheless, when possible a record is made of the amount of protein in the meal taken prior to the collection of serum or urine for analysis, and of the time after the consumption of the meal at which specimens are collected.

Effect of Intravenous Amino Acid Administration on Serum and Urinary Amino Acids.

Specimens of blood and urine were examined from a person receiving intravenously "Parenamine" (fortified casein hydrolysate). Specimens were collected immediately

TABLE II.

Effect of Protein Meal on Serum and Urinary Amino Acids.[1]

Test Conditions.	Urine.									Serum.									
	Cystine.	Histidine.	Glutamine.	Alanine.	Threonine.	Taurine.	Serine.	Glycine.	Total.	Histidine.	Glutamine.	Valine.	Alanine.	Threonine.	Taurine.	Serine.	Glycine.	Glutamic Acid.	Aspartic Acid.	Total.
Patient fasting	1	4	3	1	0	1	3	5	18	1	3	1	2	1	2	1	3	4	0	18
Three hours after administration of 20 grammes of protein	1	4	3	2	1	1	4	5	21	2	3	2	3	1	2	1	3	3	1	21
Seven hours after administration of 20 grammes of protein	2	4	4	2	2	2	4	5	25	3	3	3	3	0	2	1	3	3	0	21
Patient fasting	1	2	2	2	0	1	5	5	18	0	2	2	2	0	2	1	3	4	0	16
Three hours after administration of 20 grammes of protein	0	3	3	3	2	3	5	6	25	2	3	3	3	1	2	1	3	3	0	21
Seven hours after administration of 20 grammes of protein	2	3	2	2	2	3	5	6	25	2	2	2	3	0	2	1	3	3	0	18

[1] Expressed in terms of intensity of colour with nihydrin.

before treatment and again two and fifteen hours after the completion of nine hours of intravenous infusion with "Parenamine". In the second specimen of serum there was a definite increase in valine and a small increase in alanine, glycine and glumatic acid (the amount of taurine, serine, glutamine and aspartic acid remained unchanged); but these had returned to the pre-treatment level in the final specimen. In the corresponding specimens of urine the second specimen showed the same amount of spot "A" (the unidentified ninhydrin-reacting spot found in some normal urine), threonine, glycine, aspartic acid, glutamine and histidine, a small increase in alanine and glutamic acid, and the appearance of arginine, tryptophane and β-alanine. The final specimen showed the same chromatogram as did the specimen collected before treatment.

From this it was concluded that the serum amino acid levels and the amount of amino acids in urine return rapidly to normal after the intravenous administration of amino acid mixtures of this nature.

Alteration in Serum and Urinary Amino Acid Pattern in Pregnancy.

Smith (1949), using chromatography, has shown that the urinary amino acids increase in amount and variety during pregnancy. In 1950 Wallraff *et alii* carried out similar experiments using microbiological methods and found that during pregnancy there was an increase in the urinary excretion of histidine, tyrosine, serine, arginine, phenylalanine, threonine and tryptophane, as compared with normal excretion in non-pregnant women. Sims (1951) suggests that this is due to an alteration in renal threshold, possibly the result of increased ACTH activity.

In our experiments chromatographic comparison of serum and urinary amino acids during pregnancy has shown that, although the average total amino acid excretion increases only irregularly during pregnancy and is usually within the normal range, the range is more variable than in normal non-pregnant women and tends to be higher particularly during the last month of pregnancy, while there is usually a pronounced fall in urinary amino acid excretion on the patient's admission to the labour ward. The amino aciduria is merely an accentuation of the normal urinary pattern and quite unlike that found in cystinuria or the Fanconi syndrome. These changes appear more marked when results from specimens from the same subject are examined, and a typical example is given in Table III.

As the pregnancy proceeds there is also a fall in serum amino acids, which on the patient's admission to the labour ward tend to revert to the pattern found in non-pregnant women, while six weeks *post partum* the normal pattern for non-pregnant women is found. This may merely reflect the hæmodilution known to occur during pregnancy.

It is also of interest to note that histidine was detected regularly in the urine of non-pregnant women in amounts similar to those found during pregnancy. The detection of histidine as a diagnostic test for pregnancy must therefore be of little value.

Serum Amino Acids in Diabetic Ketosis.

In 1952 Gray *et alii* reported that amino aciduria occurred during diabetic ketosis and was believed to be due to amino acid overproduction. Specimens of serum were therefore examined from a patient suffering from diabetic acidosis, and being treated by intravenous therapy, to see whether there were any gross alterations in serum amino acid pattern (urine specimens were not collected). The relative amino acid concentration compared with the corresponding electrolyte pattern is shown in Table IV.

As can be seen, the initial value for amino acids was rather high and might account for an increased loss of amino acids in urine. This increased concentration could be due merely to the degree of dehydration (which was quite severe at this stage), and was followed by a reduction in amino acid content as fluid was replaced by intravenous therapy. On the other hand, the content rose again after the electrolyte pattern had been restored to normal. It is thought that more complete observations of this nature should be carried out.

Effect of ACTH on Serum Amino Acids.

Stephens *et alii* (1950), using chromatographic methods of assay, found no significant alteration in serum amino acids in normal people receiving ACTH; but the serum of people with rheumatoid arthritis showed an increase in arginine, lysine and threonine.

Serum from a patient with acute nephritis was examined before and seven days after the commencement of treatment with 20 milligrammes of ACTH every six hours. The initial amino acid concentration was subnormal, but rose to the normal level during treatment. During this period, however, the condition of the patient deteriorated, the blood urea nitrogen level rose from 42 to 95 milligrammes per 100 millilitres, the serum potassium content rose to eight milliequivalents per litre, and the carbon dioxide combining power fell to 11 milliequivalents per litre. It is therefore difficult to decide whether the altered serum amino acid picture can be attributed solely to the administration of ACTH.

Cystinuria.

Examination of a specimen of urine collected from a cystinuric some years ago and stored in the refrigerator under toluol showed the presence of excess cystine and the basic amino acids lysine and arginine. A second patient, who had had a cystine calculus removed, presented a

TABLE III.

Typical Variations in Urine and Serum Amino Acids During Pregnancy.[1]

Time of Test.	"A."	Trypto-phane.	Cystine.	Hist-idine.	Glut-amine.	Valine.	Alanine.	Thre-onine.	Taurine.	Serine.	Glycine.	Glutamic Acid.	Aspartic Acid.	Total.
Urine.														
18th week	1	0	0	1	1	0	2	0	3	0	6	5	0	19
27th week	2	0	3	2	2	0	3	0	2	3	3	4	0	24
31st week	1	0	3	3	4	0	4	3	3	5	4	2	0	32
35th week	1	0	3	4	4	1	5	3	1	5	4	1	0	32
Admission to labour ward	2	0	5	5	6	0	7	5	2	5	4	2	2	45
Serum.														
18th week	0	2	0	0	5	2	3	0	2	3	3	4	3	27
27th week	0	0	0	1	4	0	2	0	1	2	2	3	2	17
31st week	0	0	0	0	4	0	3	1	1	2	2	3	1	17
35th week	0	0	0	2	3	1	2	0	0	2	1	2	1	14
Admission to labour ward	0	0	0	2	3	1	3	1	2	2	1	5	2	22

[1] Expressed in terms of intensity of colour with ninhydrin.

similar picture. This is in agreement with the work of Dent (1950) and others, who believe that cystinuria is almost invariably accompanied by lysinuria and argininuria, and is due to lowered renal threshold or failure in renal absorption of these amino acids.

Fanconi Syndrome.

A specimen of urine obtained from a patient with the Fanconi syndrome was examined for amino acids, and showed the typical picture of gross amino aciduria, with the appearance of many unusual amino acids.

TABLE IV.
Variation in Serum Amino Acids During Treatment of Diabetic Acidosis.

Time.	Sodium.[1]	Potassium.[1]	Carbon Dioxide Combining Power.[1]	Protein. (Grammes *per Centum.*)	Total Amino Acids (Assessed by Chromatogram).
2.30 p.m. ..	135	5·5	11	8·3	31 } [2]
5.30 p.m. ..	145	4·5	12	7·3	24 } [2]
9.30 p.m. ..	165	5·5	—	6·7	20 } [2]
9.30 a.m. ..	155	5·0	—	6·1	21
3.0 p.m. ..	140	5·5	—	6·1	28
10.0 a.m. ..	145	4·5	24	5·4	34

[1] Milliequivalents per litre.

[2] Eleven litres of saline given intravenously.

Renal Acidosis.

A patient suffering from renal acidosis with osteomalacia was examined for amino aciduria, which sometimes accompanies this disease (Dent, 1952); but the chromatogram was normal.

"Failure to Thrive" in Infants.

"Failure to thrive" in infants is sometimes associated with amino aciduria, and a summary of some aciduric conditions has been given by Dent (1950). More recently amino aciduria associated with galactosæmia has been reported by Holzel *et alii* (1952).

In order to exclude these causes of failure to thrive, specimens of urine from two infants were examined and the results compared with those obtained from specimens from two normal infants of about the same age (twelve months). The chromatograms obtained from all four specimens did not differ significantly, and, with the exception of the presence of small amounts of arginine and lysine, the amount and distribution of the amino acids resembled those found in specimens from normal adults.

Renal Glycosuria.

According to Dent (1952), amino aciduria is often accompanied by renal glycosuria, presumably because the sites of reabsorption of glucose and amino acids from the renal tubules lie close together. However, glycosuria is often the only renal defect, and a patient with severe renal glycosuria who was examined showed a low normal excretion of amino acids.

Nephritis.

Specimens from a patient suffering from nephritis showing gross proteinuria (presumably associated with glomerular damage) were examined, and the amino acid patterns from both urine and serum were found to be normal.

Glycogen Storage Disease.

The pattern from urine and serum obtained from a boy, aged fourteen years, with glycogen storage disease showed a normal distribution of amino acids.

Liver Damage.

There have been several reports of amino aciduria occurring in the terminal stages of liver diseases and more particularly of acute yellow atrophy of the liver (Dent, 1950). Two cases of severe chronic liver damage following infectious hepatitis have been examined. In one of these the urinary chromatograms showed a somewhat heavy excretion of amino acids, but with the exception of the presence of a trace of arginine the pattern was within the normal range.

The first specimen obtained in the second case showed a rather low excretion of amino acids. A second specimen, obtained a week later when clinically the patient's condition had deteriorated considerably, showed a similar pattern, but with the appearance of large quantities of methionine and some arginine and lysine. A similar picture was obtained ten days later. As the condition of the patient improved, methionine, arginine and lysine were no longer detected, and the amount of cystine and taurine detected as well as total amino acid content increased considerably. Results obtained are recorded in Table V.

Animals.

Because of the difficulty of obtaining pure methyl histidine, amino acid chromatograms of urine from dogs were prepared and showed the typical green spot of methyl histidine which is a normal constituent of canine urine. By this means it was possible to identify methyl histidine present in other specimens. All the animals showed a more pronounced amino aciduria than occurs in humans, and the presence of lysine, arginine and cystine could readily be detected. It should be pointed out that two of the animals had had renal calculi and in one the stones contained cystine, so that it is possible that these two animals were cystinurics.

The amino acid chromatograms of urine from a sheep which had "ochronosis" did not differ significantly from those of urine from a normal sheep.

Amniotic Fluid.

A specimen of amniotic fluid with a protein concentration of 120 milligrammes per 100 millilitres and a glucose concentration of 70 milligrammes per 100 millilitres showed the presence of histidine, glutamine, serine, glycine, glumatic acid and aspartic acid in amounts similar to those found in serum during the later weeks of pregnancy.

TABLE V.
Amino Acids in Urine Associated with Severe Liver Damage.[1]

Date.	Arginine.	Lysine.	Leucine and Methionine.	"A."	Tryptophane.	Cystine.	Histidine.	Glutamine.	Valine.	Alanine.	Threonine.	Taurine.	Serine.	Glycine.	Glutamic Acid.	Aspartic Acid.	Total Amino Acid.
October 3, 1952	0	0	0	1	0	1	1	3	1	2	0	0	2	3	2	1	17
October 16, 1952	2	1	6	0	1	1	0	2	1	3	0	2	0	3	1	0	23
October 26, 1952	2	1	6	1	0	1	0	1	1	3	0	2	0	3	2	1	24
October 30, 1952	2	2	0	1	0	2	3	3	0	2	0	4	3	5	1	0	28
November 16, 1952	0	0	0	3	0	6	3	3	3	3	0	7	0	5	5	0	38
December 1, 1952	0	0	0	0	0	5	0	3	1	3	0	8	3	3	3	0	29

[1] Expressed in terms of intensity of colour with ninhydrin.

Cerebro-Spinal Fluid.

Up to 500 microlitres of cerebro-spinal fluid were applied to the chromatogram and examined for amino acids, but the amounts present were too small to detect without further concentration. Special methods of concentration would be required to show the pattern of distribution.

Ascitic Fluid.

Only a trace of amino acids could be detected when 500 microlitres of ascitic fluid from a subject with nephritis were examined chromatographically.

Summary.

Methods for carrying out chromatographic analysis of biological fluids for amino acids suitable for use in a routine laboratory are given, and the results obtained in a variety of clinical conditions are recorded.

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Reviews.

Some Problems in Neurophysiology. By F. Bremer; 1953. London: University of London, The Athlone Press. Sydney: Walter Standish and Sons. 9" x 5½", pp. 88, with 32 illustrations. Price: 21s.

THIS book by the Professor of General Pathology in the University of Brussels has chapters on synaptic transmission, electroencephalography and the auditory area of the brain. The text with an addendum is that delivered as three lectures at the University of London in 1950. Even for that time the material presented was not comprehensive, and three years later it is even less contemporary. The chief virtue of this publication is that it gives to a wider audience Professor Bremer's point of view on these matters.

Hernia: A Manual for Truss Fitters. By Francis Mitchell-Heggs, T.D., M.B., B.S. (London), F.R.C.S. (England), F.R.C.S. (Edinburgh), with forewords by Cecil Wakeley, K.B.E., C.B., F.R.C.S. (England), F.A.C.S., F.R.A.C.S., and Claude Frankau, C.B.E., D.S.O., M.S., F.R.C.S. (England); 1953. London: J. and A. Churchill, Limited. 10" x 7½", pp. 144, with 97 illustrations. Price: 25s.

THIS book is written as a text-book to assist in the training of certified truss fitters associated with the Institute of British Surgical Technicians. Most practitioners are little interested in the type of truss ordered and the fitting, and if this is left wholly to technicians it is essential that they be efficiently trained. In this book sufficient elementary anatomy and physiology is included to make the average lay reader cognizant of the condition under discussion. For a femoral hernia, wherever possible, operation is advised, especially as the successful fitting and application of a femoral truss are somewhat difficult. However, the varieties and fitting of femoral trusses are fully described. The clinical aspects of hernias are thoroughly covered and the principles of truss measuring and fitting are described in a separate chapter. The illustrations are of a high order and are so descriptive as to make the text very clear. Practitioners as well as truss fitting technicians would greatly benefit by reading this book.

Notes on Books, Current Journals and New Appliances.

Family Doctor. Published monthly by the proprietors, the British Medical Association, Tavistock Square, London, E.C.1. Sole agents for Australia and New Zealand: Gordon and Gotch (Australia), Limited. Subscription for twelve months: 20s. (sterling), including postage.

THE October issue of this popular medical publication is worth buying just for a series of vivid baby pictures accompanying a practical article on the diet of young children; the article, too, will be acceptable to mothers looking for new but sound ideas on the subject and to doctors who have to advise them. Several other articles deal helpfully with food and its preparation. Other subjects discussed include television for children, anger, genes and heredity, hernia, spectacles and the fatherless child. The attractive and common-sense way in which these and other medical subjects are handled is a matter for continued congratulation of those responsible for *Family Doctor*. Anyone with misgivings about medical publications for popular consumption is urged to let *Family Doctor* speak for itself. A free sample copy will be sent to any reader who applies to the Editor of THE MEDICAL JOURNAL OF AUSTRALIA.

Books Received.

[*The mention of a book in this column does not imply that no review will appear in a subsequent issue.*]

"Atlas of Medical Mycology", by Emma Sadler Moss, B.S., B.M., M.D., and Albert Louis McQuown, B.S., B.M., M.D.; 1953. London: Baillière, Tindall and Cox. 10" x 7", pp. 254, with 248 illustrations. Price: 61s. 6d.

The atlas is the outcome of a series of exhibits prepared for medical gatherings of different kinds.

"Shoulder Lesions", by H. F. Moseley, M.A., D.M., M.Ch. (Oxon.), F.R.C.S. (England and Canada), F.A.C.S.; Second Edition; 1953. New York: Paul B. Hoeber, Incorporated. 10½" x 8", pp. 346, with 216 illustrations and 41 plates in colour. Price: $12.00.

Intended as a reference book on the diagnosis and treatment of diseases and injuries of the shoulder.

"Emotional Factors in Skin Disease", by Eric Wittkower, M.D., and Brian Russell, M.D., with contributions from Peter Edgell, Desmond Irwin and John Slorach, and forewords by Dr. R. M. B. MacKenna and Professor D. E. Cameron; 1953. New York: Paul B. Hoeber, Incorporated. A Psychosomatic Medicine Monograph. 9½" x 6¼", pp. 224. Price: $4.00.

The two chief authors of the book are a dermatologist and a psychiatrist.

"Dermatologic Formulary: From the New York Skin and Cancer Unit, Service of Dermatology", edited by Frances Pascher, M.D.; 1953. New York: Paul B. Hoeber, Incorporated. 7½" x 5", pp. 160. Price: $3.00.

This formulary is the product of "composite experience gained by leading teachers of dermatology".

"Dermatology: In General Practice", by Jacob Hyams Swartz, M.D., with a foreword by C. Guy Lane, M.D.; 1953. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" x 6½", pp. 602, with 253 illustrations. Price: £5 18s. 3d.

Designed to serve the general practitioner; "makes no pretense at serving the purposes of a reference book for dermatologists".

The Medical Journal of Australia

SATURDAY, OCTOBER 24, 1953.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: surname of author, initials of author, year, full title of article, name of journal without abbreviation, volume, number of first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE MEDICAL RESEARCH COUNCIL OF GREAT BRITAIN.

THE report of the Medical Research Council of Great Britain for the year 1951-1952 was presented by the Lord President of the Council to Parliament by command of Her Majesty in June, 1953. It is a valuable document which calls for more than passing notice. So much is heard and read of the National Medical Service in Great Britain and of the position and prospects of the medical practitioner concerned in its working that it is salutary to take at least a bird's-eye view of medical research in Great Britain, of the official attitude to it and of the enormous amount of work that is being done. Britons are concerned with more than the immediate needs of ailing citizens; they foster an elaborate organization to unravel the mysteries of disease, and in so doing set an example to the units of the British Commonwealth of Nations.

During the financial year 1951-1952 (the period ended on March 31, 1952) the total expenditure of public funds by the Council was £1,587,544 on ordinary account and £137,704 on non-recurrent account. The amount is increasing, because we read in the introduction, which is signed by Lord Salisbury, Lord President of the Committee of the Privy Council for Medical Research, that during the financial year 1952-1953 Parliament provided for the Medical Research Council a grant-in-aid of £1,665,917 on the ordinary account and £232,370 on the non-recurrent account for special apparatus and buildings. It is a little difficult to follow the financial statements because in one place reference is made to the financial year ended March 31, 1952, and in another to that ended September 30, 1952. However, we may take it that for the latter period the percentage expenditure was as follows: Administration accounted for 4% (it was 3·7% if non-recurrent expenditure and certain benefactions and so on were included); general scientific purposes accounted for 0·8%; the National Institute for Medical Research for 21·9%; research units and external staff for 53·0%; special schemes for 11·6% and temporary research grants and training awards for 8·7%. Among the benefactions were 99,000 dollars from organizations in the United States and upwards of £48,000 from trusts and bequests in the United Kingdom. The number of the staff employed by the Council for its own purposes was 1427. This figure was made up of 441 members of the scientific staff (152 of these were medically qualified), 519 members of the technical staff, 264 on the administrative side and 156 full-time and 47 part-time members of the maintenance staff. In addition there were 50 members of the African staff employed at the field research station at Gambia. The Council, as agents for the Ministry of Health, employed 920 members of the Public Health Laboratory Service.

Readers may perhaps be curious about a Public Health Laboratory Service, directed by the Council for the Ministry of Health. The necessary funds are provided by the Ministry of Health and the service was first introduced as a wartime emergency service. (Reference was made to it in our review of "The Emergency Medical Services" in the issue of May 9, 1953.) The service was established on a permanent basis under the *National Health Service Act* of 1946. In addition to six regional, forty-four area and eight associated laboratories there are now eight reference and five special laboratories in the service. It is of interest to note that some of the reference and special laboratories "also serve workers in the British Commonwealth and in other countries". It must not be thought that this service is concerned only with "the immediate problems of public health". Problems of preventive medicine and epidemiology are dealt with and we are told that the constitution of the service is well adapted to the organization of group research. Further, by virtue of its close association with local medical officers, the service "is in a favourable position for carrying out controlled field trials of prophylactic agents". In the summary of the research carried out by this service three groups are mentioned. In the first, dealing with infectious diseases, no less than twenty-three different conditions or groups of conditions are mentioned, and each has several sub-groupings; the second comprises sanitary bacteriology with six groupings, the largest of which is air hygiene with eight sub-groupings; the third is a miscellaneous group with seven subjects. The Director of the Public Health Laboratory Service is Dr. G. S. Wilson, and the list of publications by members of its staff covers four pages.

The work of the Council's staff is formidable; it covers more than thirty pages of the report. This is not the main part of the report, which differs somewhat from the documents of previous years. On this occasion the subject of clinical research has been discussed at some length and we are promised that in future years important aspects of study will be selected for special mention. The reader is reminded that the progress of medical research in the present century has been due to increasing application of the scientific method to biological phenomena. Advance has been early and rapid in those branches

centred in the laboratory; it has been slower and more delayed in those directly concerned with sick persons. Progress in the clinical field is now extending beyond the stage of observation and description of syndromes into a stage characterized by planned investigation of illness. A somewhat detailed description of the special features of scientific clinical research is given. Scientific studies begin with accurate observation of natural phenomena. These are classified, and on this basis generalizations are made and put to the test either by observation of their compatibility with future naturally occurring events or by the deliberate testing of their validity in artificial but appropriate circumstances devised for the purpose. The distinction between the observational and the experimental sciences rests on this difference in the method of the testing of concepts. In so far as a branch of knowledge is susceptible to a devised test it can be regarded as an experimental science; in so far as it is not susceptible to this technique and must rely on future events it is an observational science. The scientific method of thought is applicable to both methods, but clearly the observational method is heavily handicapped. In clinical medicine experimentation must be limited to investigations which involve no risk to the patient and enlist his willing cooperation. It is pointed out that there are some branches of clinical research, such as epidemiology, in which the object of study is a naturally occurring event and in which the experimental method is not applicable. Chemical and instrumental methods, as well as the application of statistical techniques, have made possible planned observations and controlled clinical trials. In other words the clinical observer can become a clinical investigator. Appropriate reference is made to the history of clinical research in relation to the Council. In 1913, when the Medical Research Committee (the predecessor of the present Council) came into being, it tried to give its main attention to the promotion of work in the clinical field. We are told that this attempt was premature. Nevertheless, the first unit to be established by the Council was the Department of Clinical Research at University College Hospital Medical School. Here the Council "took advantage of an unusual opportunity dependent on an unusual man"; this man was Thomas Lewis, who "was in advance of his age". By 1939 the Council had established three clinical research units; in 1948 it had eighteen. Today the Council is spending over £400,000 a year on investigations directly concerned with patients; this amount excludes support given to such closely related subjects as pathology, bacteriology, epidemiology, medical statistics and social medicine.

This picture is stimulating. Those interested in clinical research who live outside the United Kingdom will wish to know what effect the National Health Service of Great Britain will have upon it. The report gives two reasons for examining the provision of clinical research. The first is the fact that the growth of knowledge and the supply of trained men have reached a stage at which clinical research can be developed with confidence on a scale commensurate with the need. The second is that the creation of the National Health Service means that new arrangements must be made to provide the necessary facilities for clinical research. In regard to the latter it is encouraging to note that a close liaison has been created between all the bodies concerned. The Medical Research Council received from the Standing Medical Committee of the Ministry of Health an invitation to discuss what new arrangements were required. A Joint Committee was formed under the chairmanship of Sir Henry Cohen. At the same time the Advisory Committee on Medical Research in Scotland was concerned with the problem. These bodies drew up a report which was submitted to Health Department Ministers and the Lord President of the Council. The Ministers have accepted the recommendations in principle and are discussing their implementation. The recommendations for the future organization of clinical research in Great Britain are summarized under three headings. The first is that a control organization for the promotion of clinical research should be established as part of the Medical Research Council. The second is that provision should be made for decentralized research at the level of regional hospital boards, boards of governors of teaching hospitals and hospital management committees. The third is that careers in clinical research should be equated with careers in the National Health Service.

Centres of medical learning in Australia and boards of teaching hospitals and of other large hospitals cannot fail to be interested in this Medical Research Council report. It will well repay careful study, for clinical research is extending and must extend still further in this country. We must always remember that medical research in Great Britain has been built on a sure and solid foundation which may be copied.

Current Comment.

PRELIMINARY SURVEY ON FEMORAL HEAD PROSTHESES.

In April and May of 1952 the Committee on Scientific Investigation of the American Academy of Orthopedic Surgeons commenced a preliminary survey on the use of femoral head prostheses by sending to all members of the Academy a *questionnaire* containing nine questions. Of a total membership of 1580, 587 returned their *questionnaires*, that is, 37%. Apparently the members of the medical profession in the United States are no more enthusiastic about answering *questionnaires* than are their colleagues in Australia. The report of the survey adds, without comment: "One member thought we should stop making surveys." In answer to the first question, 466 members of the total of 587 disclosed that they were at present using femoral head prostheses; 121 stated that they were not using them. Those who were using them had inserted a total of 6156 prostheses, an average per member of 13·2. The average time of follow-up was just over ten months. Of the types of prosthesis used, the Judet type was much the most popular, with the Eicher next in line. The information given about the types of incision preferred is difficult to assess as the Committee found trouble in deciding exactly which incisions were being referred to by many of those who answered. The most common indication for the use of a femoral head prosthesis was non-union; this was listed by 315 members. Next in order were aseptic necrosis (299), osteoarthritis and *malum coxæ senilis* (279) and fresh fracture in the aged (190). Less common indications were fresh fracture in younger patients, pain, congenital dislocation of the hip, old slipped capital femoral epiphysis. The most common contraindication listed was the fact that the patient

belonged to a younger age group, but the Committee reports that there seems to be a great variation in what the members consider as the younger group; it ranges anywhere from forty to sixty-five years. The next most frequent contraindication was recent infection, then tuberculosis. Further down the list were rheumatoid arthritis, osteoporosis, poor risk, insufficient neck, viable head, dysplasia and "patients too old", with a number of other contraindications. Among the complications met with, dislocation (158) heads the list. Next (80 each) come infection and fracture of the shaft of the trochanter during insertion of the prosthesis. The Committee comments that the figure for infection seems far too high a percentage for a group of certified orthopædic surgeons. Other commoner complications were pain, loose prosthesis, broken prosthesis, limp, and absorption of the neck of the femur. At this stage in their report, the Committee again emphasize that this was a preliminary survey to find out how active the members were in the use of some types of prosthesis. The *questionnaire* did not ask for results, and the Committee feels that it is far too early to ask for results. The Committee also carefully analysed the replies received from the 121 members who said they had not used a femoral head prosthesis. Of these, 57 made no comment or answered "No", some of them very emphatically. Twenty-one stated that they had not yet used a prosthesis, but would use one in a suitable case. Nine reported that they had had too few cases or that the time of follow-up was too short, so that they did not feel they wanted to add their statistics to the survey. Eight were waiting on the present report to see whether they should or should not use a femoral head prosthesis.

From the results of this preliminary survey the Committee has compiled the following list of its impressions: (i) Too many prostheses are being used for too many indications. (ii) The trend is towards abandonment of the Judet prosthesis made of acrylic. (iii) There is increased use of intramedullary types of prostheses. (iv) The Gibson approach is the most popular. (v) Indications are becoming more definite. (vi) The complications are too great. (vii) The survey is to be continued until there is a follow-up time of three to five years. It is considered that at the end of that time an attempt to evaluate results can be made. A number of comments are made on the impressions of the question of indications. The Committee thinks that with further use the wide field of present indications can be narrowed down. On the matter of complications it considers that these have been appalling and that if a procedure cannot be performed with fewer complications than those recorded, something is wrong. Perhaps the later results of the continued survey will help to clear the air. In conclusion, the Committee points out that many have expressed the opinion that the promiscuous use of the device should be curtailed and that manufacturers and salesmen should be disciplined until a better evaluation has been made. The Committee states quite reasonably that it does not see how it can discipline the manufacturers and salesmen, and it states rather that each individual, as a member of the Academy, should discipline himself—a fair comment that is generally applicable in most fields of medical and surgical practice.

INSULIN REACTIONS AS A SOCIAL PROBLEM.

Perhaps it is not so widely known as it should be that insulin reactions have shown a certain degree of alteration in type during recent years. The reason for this is the increasing use of the slower acting varieties of insulin. The postponement of reactions beyond the time familiar in the use of crystalline insulin is, of course, well known to members of the medical profession, but it may not be clearly understood by relatives or business associates of patients. Robert K. Maddock and Leo P. Krall,[1] looking at the question from the viewpoint of a public health service, claim that many diabetic patients have insulin reactions which are not detected even by medically trained persons. They point out that this situation still persists after twenty-five years of use of the long-acting insulins, although the classical signs of sweating, tremor, hunger and palpitation, as well as double vision and, in severe cases, loss of consciousness, are well known as being part of the acute hypoglycæmic syndrome. Maddock and Krall believe, however, that headache, disturbances of personality, often slight in degree, difficulties in speech or vision, and varieties of automatism form a group of symptoms which are often overlooked as being due to hypoglycæmia. This group they term the "central nervous system type", and they warn us that the patient may suffer a reaction of this type, associated with a disturbance of intelligence which prevents him from realizing the true nature of the manifestation. The aberrant actions of a diabetic under such conditions may lead him into serious trouble, ranging from conflict with authority to danger to life. It is on this text, the central nervous system reactions, that Maddock and Krall have written their article. They deal first with the mechanism of insulin reactions, and employ a simple diagram to illustrate schematically what happens when insulin acts quickly and when it acts slowly, with its effects perhaps veiled by sleep or barbiturate drugs. The main difference is that in slow reactions the adrenaline effect is minimal, and the brunt falls on the brain, while only a relatively small amount of glucose is released from stored glycogen. In this instance the fall of blood sugar is slow and its rise is likewise slow, an important matter when treatment is required. The intracerebral mechanism the authors regard as rather obscure, but they suggest that the nerve cells are gradually deprived of their source of energy, and that the slow-acting insulin does not call for an increase in the circulating adrenaline. Mixed reactions may occur, but either the adrenaline-like type or the central nervous system type will predominate. The authors give a number of instances taken from case histories, and in these the point is made that the true nature of the bizarre behaviour of the patients was not understood at first. One patient was a fire-engine driver, a diabetic believed to be controlled, yet after taking double doses in error he was charged with careless driving, and later thought to have epilepsy. Another controlled patient had emotional crises at home, which settled down after she had breakfast. Such instances could be multiplied; their common factor was the non-understanding by the patient and his intimate companions of the true nature of cerebral disturbances unlike the familiar "shaky" insulin attacks, and often with a high emotional content. An Australian physician once certified a very intelligent and apparently well-controlled diabetic patient as being perfectly fit to drive a motor-car, but the patient after changing his brand of insulin was brought rather unwillingly to see his doctor because at certain hours of the morning he would behave in a most curious way, though he insisted that he was perfectly well. Nevertheless, the correct diagnosis was in this instance made by a business associate.

There is nothing really novel in this rather artificial separation of insulin reactions into two types, but surely we must agree with the present authors that patients and their associates who take an intelligent interest in the treatment of diabetes do not necessarily grasp how protean are the manifestations of a lowering of the sugar level in the blood and in the body. After all, diabetes is the best of all examples of a disease in which the trustworthy patient becomes his own doctor, at least to some extent, and it is important to ensure that all precautions are taken to safeguard him from his own over-confidence. This is all the more important today, when the diabetic is permitted and encouraged to live that life of comparative freedom which is his right.

[1] *Arch. Int. Med.*, June, 1953.

ILLNESS ABSENCE RATES IN INDUSTRY.

It is well known that certain types of person show higher rates of absenteeism in industry than others. There are those who appear to be prone to illness, just as there

are those who appear to be prone to accident. Considerable attention has been paid to those who seem to be of a weaker fibre which does not protect them from loss of time from that important activity, the earning of a living. Norman Plummer and Lawrence E. Hinkle in a study of the medical significance of illness and absence in an industrial population remark[1] that the medical practitioner in industry spends most of his professional time with those employees who are frequently ill and absent from work, and little with those who are well and are seldom absent from work. They have made a comparison between these groups, and early in their investigations were impressed with the freedom from illness of employees with low absence rate, and conversely, with the frequency of illness in those with a high absence record. This statement is not so obvious as it may appear; Plummer and Hinkle were further impressed with the fact that the well employees were indeed very well, and the sick employees took up a great deal of time and attention on the part of doctors, clinics and hospitals. Were there any common factors affecting the individuals comprising these two groups? In a previous statistical study the authors investigated the absences from work of 1297 women, and found that absence, in terms of both the number of days and the number of times absent, was made up by quite a small proportion of workers. Most of the absences were of an habitual order, and those who had a clear record for a given period tended to maintain that pattern over a much longer period. In fact the authors state that the absence pattern for an employee was almost as characteristic as the pattern of the pulse, blood pressure or weight, and was almost as difficult to alter as, say, the weight pattern. These points are illustrated by a series of graphs, and on this foundation the medical, industrial and sociological implications are studied. By random selection 20 women were chosen from both the low and high absence groups, and the administrative data available in the company's record concerning them were studied. The confidential records were then reviewed; some of these concerned periodical examinations only, others were in connexion with return to work after illness. It is interesting to look at a photograph of the small pile of such records of the low absence group, and to see how they are far surpassed in size by those of the high absence group. Analyses of various categories of ill health were made from these records: the low absence group make a much better showing in diseases of the respiratory, traumatic, gynæcological and psychiatric types, and further have suffered far less at the hands of the surgeon. Many of the employees studied had been in the same employment for a period of years. Those who had had few absences were seldom away because of colds or menstrual disturbances. Interviews were obtained with a typical employee of each group, but true statistical importance can hardly be attached to these, though they are interesting. It is not surprising to find that a worker with few absences was of happy and contented type, or that one with a different record was discontented and resentful. The real question at issue in this study is how individuals in these groups can be recognized, how their maladies should be evaluated, and how they should be managed. As the authors point out, these problems are well recognized today, and are met by the human relations programmes which are part of the modern study of industry. The medical officer has an important part to play. Plummer and Tinkle show that he has just the same question to answer as the private practitioner, and that, while his aim is to treat the patient for the symptoms complained of, he must also perceive and treat the underlying disorder. He must reach an understanding of the emotional life of the frequent absentees, and of their reactions to stress and the strains of life, but he must beware of assuming that all such patients are suffering from psychoneurotic disturbances or hysteria. He has a responsibility in not overlooking the possible existence of some serious organic disease.

Finally, the writers allude to the problems which are to be faced in the future. The high costs which frequent absenteeism may cause may perhaps be mitigated by the greater use of preventive measures, but the difficulties in giving the ideal type of medical service in industry will be appreciated by all conscientious doctors. Some figures of costs are given, but we cannot enter into these, except perhaps in one instance. A foundation which is investigating the common cold states that 4,000,000,000 dollars are lost annually to industry from this cause, but Plummer and Hinkle think that the cost is not so great as stated. Surely we would agree with them that it is likely that there are other factors of importance as well as those which concern physical infection by the virus of the common cold; we cannot neglect the effects of the problems of inner life. These may not have any relevant action on the respiratory tract, but they may supply a motive for acceptance of or escape from a situation.

[1] *Ann. Int. Med.*, July, 1953.

WERNER'S SYNDROME.

THE interest stirred by rare conditions in medicine is not merely due to the opportunity afforded the collector of the unusual, or the hair splitting which seems to inspire the pursuit of accuracy in terminology. Werner's syndrome is one of the rare familial or hereditary disorders which has aroused inquiry during the last fifty years, and which may also be similar to or identical with states described by earlier writers. No pathological name has been applied to it which is truly apt; perhaps the general term of "progeria" might apply to some of its features, but the pathological bias of modern medicine discourages us from being satisfied by bestowing a merely descriptive name. Eponymic names have come into use once more, and have the advantage that they refer us to the literature and stimulate our powers of observation and description. Werner's account was published in 1904, and has been followed by a number of other contributions on the subject. The latest of these give full descriptions of additional cases: Lennart Müller and Bo Andersson[1] present two cases, and add 31 references to literature, and Glenn W. Irwin and Paula B. Ward[2] also have studied two cases and append a brief bibliography of nine references.

These authors point out that the original description laid emphasis on the precocious development of cataracts, though Werner, an ophthalmologist, described the scleroderma-like changes in the skin, the trophic lesions on the lower extremities, and the early greying of the hair. The four present authors give good accounts of the appearance of the patients and the outstanding signs. The chief features are short stature evinced after adolescence, slenderness of the extremities, signs of premature senility, such as grey hair, or baldness, atrophy of the skin and subcutaneous tissue, vascular sclerosis, juvenile cataracts, patchy hyperkeratosis, with ulcers on ankles and heels, lowered sugar tolerance, hypogonadism, and finally, existence of an hereditary factor. The premature senile changes produce certain characteristics of body habitus and facies which will be apparent to a careful observer, but which need not be specially described here. Müller and Andersson's cases are of particular interest as the individuals were brother and sister. Both these patients presented the triad of symptoms which the authors consider typical of Werner's syndrome, pre-senility, skin changes and cataracts. They state clearly that the eyes showed "no simple cataract", since deviations from the pattern of the simple cataract are found. Though there does not appear to be any warrant for regarding such endocrine changes as are observed in this syndrome as of true ætiological importance, the presence of such changes is of diagnostic significance. For instance, there is a tendency to the development of diabetes. Irwin and Ward mention that one of their patients had clinical hypogonadism, and both had osteoporosis, but there was no evidence of any primary deficiency or abnormality of the thyroid, parathyroid or pituitary glands. No specific form of treatment is suggested; even symptomatic treatment

[1] *Acta med. scandinav.*, Supplement 283 to Volume 146, 1953.
[2] *Am. J. Med.*, August, 1953.

was not very satisfactory; the ulcerative lesions, for example, were resistent to the usual measures. Testosterone was administered to Irwin and Ward's female patient for two years without any evidence of benefit. It may be remarked that this patient was unusual in other ways; she had six normal pregnancies, but had the menopause at the age of thirty-eight years. This syndrome will probably be diagnosed more frequently if it is borne in mind. Perhaps it may be thought that a rare condition like this is merely of academic interest, but studies of such unusual aberrations, if carefully made, may result in greater knowledge of the human life cycle.

IATROGENIC HEART DISEASE.

HARRY B. WEINBERG presents a sound case for separating iatrogenic heart disease—heart disease caused by a physician—from other forms of cardiac neurosis in any classification of cardiac disease in general.[1] While he is unable to assess how frequently a fear of heart disease, with its symptomatic sequelæ, is produced by the doctor, he quotes estimates of 10% and even 60% of all cases referred to cardiologists, and refers to Paul Wood's classical paper on Da Costa's syndrome, in which 33% of cases were induced or aggravated by the medical attendant. Whatever the incidence may be, there is no avoiding the fact that all physicians have met with such cases.

Weinberg lists five possible initiating factors. The first is misinterpretation by the patient of an innocuous statement, often a casual remark such as: "Your blood pressure's low." The unlimited possibilities necessitate special care on the part of the doctor to ensure that his observations are clearly understood by the patient. Ill-considered remarks are listed as the second cause: "You have six months to live" or "You might have a stroke any minute". These call for no comment, even if made in the presence of gross organic disease. Among ill-considered acts of the physician which may provoke cardiac neurosis, Weinberg mentions the prescription of digitalis, the ordering of restrictions (which instantly negates reassurance), the invitation to a colleague to "have a listen", the meticulous examination with exercise, changes in posture and respiratory phase, and repeated estimations of the blood pressure. Appropriate explanation to the patient will do much to avoid trouble from such acts. Weinberg does not discuss the effect of a clinical demonstration to students of patients with established or suspected heart disease, but it is impossible to lay too much stress on the careful manner in which such a demonstration should be conducted. Explanation and reassurance must be given to the patient before the demonstration commences, for the benefit of both the patient and the student, whose attitude is equally easily influenced by what he hears and sees. The fourth and fifth factors in the production of iatrogenic heart disease are the misinterpretation of symptoms and the misinterpretation of signs—in other words, misdiagnosis. Weinberg observes that no instrument or other short cut exists which will obviate the need for a detailed history and a thorough examination. Without these, misdiagnosis is unforgivable.

The manifestations of iatrogenic heart disease are well known and require no emphasis. Outstanding among them are palpitations, fatigue, breathlessness and precordial pain, the last two symptoms showing certain differences from the dyspnœa and pain of uncomplicated organic heart disease. In addition the symptoms and signs common to any anxiety state may be present; in particular, on examination, there may be cold clammy hands, a costal type of respiration and evidence of an "overacting" heart. While the intelligence and emotional stability of the patient and the duration of all symptoms all influence prognosis, treatment is more likely to succeed in this group of patients than in other types of cardiac neurosis. The reason is that the symptoms depend not on an intrinsic personality defect, but on a "benign nervousness" produced by an external factor—the physician. The condition therefore responds well to the removal of fear, provided that the reassurance is decisive and unequivocal, and is accompanied by an explanation of the mechanism by which the symptoms are produced.

Weinberg enters a plea for a more liberal attitude in regard to heart disease—liberality in diagnosis, so that the patient is given the benefit of any doubt, and is reassured unequivocally, perhaps in spite of reservations in the mind of the physician; liberality in management, so that the patient with organic heart disease is not tortured by restrictions of uncertain value, and worried by unnecessary warnings. It is true, as Weinberg claims, that iatrogenic heart disease receives relatively inadequate attention in the text-books, especially in view of the fact that it can be prevented. It certainly deserves emphasis to students. If it is true that the art of first aid is the art of doing nothing till the doctor comes, then all the more responsibility rests with the physician's art to avoid a harmful effect.

[1] *Ann. Int. Med.*, January, 1953.

PROPHYLAXIS OF CALF VEIN THROMBOSIS.

PULMONARY EMBOLISM is accepted as an inevitable risk in many surgical procedures and not a few medical conditions. An enhanced awareness of the predisposing factors, leading to elimination of the "donkey", avoidance of pressure on the calves at operation and emphasis on early mobilization, considerably reduced the incidence of post-operative embolism. The anticoagulants, although used by the surgeon usually only in the presence of specific indications or perhaps as a routine in certain forms of vascular surgery, have further diminished the incidence and mortality of thrombo-embolic complications. Nevertheless, a small spike in the temperature and pulse chart, calf swelling and tenderness, pain on dorsiflexion of the foot, and prominence of the superficial veins remain signs of serious significance, and, incidentally, they remain signs which may be easily missed by the inexperienced in a patient who has recently been subjected to a major operation. However bizarre it may appear on first acquaintance, any procedure which can produce encouraging results in reducing the incidence of this disastrous complication is worthy of critical investigation.

R. W. Wilkins and his collaborators first put forward in 1952 the idea that elastic stockings might effect this, and a further progress report has recently appeared.[1] After an untreated control series had been obtained over ten months preceding the experiment, elastic stockings extending to the knee were applied to the great majority of patients entering hospital with the object of increasing the velocity of blood flow in peripheral veins, presumably by reducing their calibre. There were 4450 cases in the control series, 103 autopsies being obtained out of 189 deaths: in 21 cases there was evidence of pulmonary embolism, in seven of which it was the cause of death. Of 5467 patients given stockings, 178 died, 99 reaching autopsy. Twelve cases of pulmonary embolism were found. These results, despite the small numbers of cases, are statistically significant, and point is lent to this by a further consideration of the twelve "failures" of the method. One patient had phlebothrombosis on admission to hospital, in one case the source was not in the calf veins, and in four others the stockings were not worn.

Wilkins and J. R. Stanton (the co-author in the present paper, and one of the authors of the original paper) are careful to point out that elastic stockings are merely an additional prophylactic measure, and by no means a substitute for established methods of prevention and treatment. If such a measure is to be of value, it must be applied virtually as a routine if it is to effect a significant reduction in calf vein thrombosis and its sequelæ. The results already obtained justify the authors' continuation of the study, but in this country at present it is likely to find favour with individual surgeons rather than with institutions, if at all.

[1] *New England J. Med.*, June 25, 1953.

Abstracts from Medical Literature.

THERAPEUTICS.

Streptomycin and Pleural Adhesion Cutting.

D. C. Beatty and A. Wiener (*Thorax*, March, 1953) found that of 54 patients subjected to pleural adhesion cutting and given streptomycin for two days beforehand and three weeks after only one developed a pleural effusion. Of 61 patients not given streptomycin 16 developed pleural effusion, and from seven of the effusions tubercle bacilli were recovered.

The Administration of Isoniazide to the Mentally Ill.

A. E. Krieser *et alii* (*Dis. Chest*, January, 1953) administered isoniazide to 51 patients with tuberculosis who were also mentally ill. In about one-third of these patients moderate or pronounced improvement in the mental state was observed. In those with schizoid psychosis, 35 in number, the proportion showing such improvement was three-sevenths. No patients suffering from depressive psychosis were included in the series.

Prophylaxis with Measles Convalescent Serum.

P. E. Christensen and Henning Schmidt (*Acta med. scandinav.*, Volume 145, Fasc. 11, 1953) describe specific prophylaxis of measles in virgin soil in Greenland. They state that measles convalescent serum has been used with benefit in prophylaxis for fifty years. Gamma globulin also has a favourable prophylactic effect. These two preparations were used in an attempt to limit the course of an epidemic of measles in Southern Greenland in 1951. The prophylactic injections were given as soon as the rash was observed in the first patient in any locality. Those injected were children under the age of two years, pregnant women, tuberculous patients and persons over sixty years of age if possible. Though adequate doses were given, it was not found possible to limit the outbreak, and the death rate was greater in those injected than in untreated individuals. The authors consider that communities in Greenland, owing to their different mode of life, were not suitable for prophylactic treatment against measles.

Antibiotic Sensitivity.

A. J. Weil and L. Harris (*Ann. Int. Med.*, May, 1953) describe testing for antibiotic sensitivity in a general hospital. They state that resistance to penicillin and other antibiotics has developed in individuals and in the community. *Staphylococcus aureus* particularly has become more and more resistant to penicillin, and susceptible microbial flora tend to be replaced by different and resistant ones. Failure of home treatment with antibiotics was a frequent cause for admission to the Bronx Hospital, New York. Routine testing was carried out for susceptibility of organisms to penicillin, aureomycin, "Chloromycetin", terramycin, streptomycin, dihydrostreptomycin and bacitracin. Gram-positive cocci were frequently resistant to penicillin, both staphylococci and streptococci. "Chloromycetin" was much more efficient than aureomycin and terramycin. This was probably due to the fact that the latter had been given before the tests were applied. Streptomycins gave poor results, but bacitracin was most effective against Gram-positive cocci. Clinical experience confirmed these laboratory results. Uncommon bacteria were frequently found of the coli, proteus or pyocyaneus group in situations where they were not usually found, such as in blood cultures associated with meningitis and osteomyelitis. The results favour the use of "Chloromycetin", followed by terramycin, aureomycin and lastly penicillin and the streptomycins in a community where the antibiotics have been in general use. Bacitracin was favoured for infections by Gram-positive cocci susceptible to local therapy.

Amœbiasis.

N. J. Weiser *et alii* (*Ann. Int. Med.*, May, 1953) discuss the diagnosis and antibiotic therapy of amœbiasis. Fifty patients from the Korean war are dealt with. The authors state that symptoms were protean. Diagnosis was best made by sigmoidoscopy and a direct swab examination. Examination of stools was less certain. Diarrhœa and hepatitis were the commonest manifestations. Of troops from the tropics 20% were infected, and it is believed that 20% of persons in the United States of America may be infected. For treatment the authors used aureomycin and terramycin. Neither of these antibiotics gave satisfactory results; 40% to 50% of patients were still infected after two courses of aureomycin or terramycin. As a result, emetine was given, up to a total of 14 grains. No toxic effects were noted from emetine, but with terramycin and aureomycin there was evidence of toxicity in that hæmolytic *Staphylococcus aureus*, resistant to these antibiotics, became evident. Although emetine and chloroquine appeared to give better results, the authors were not prepared to recommend one over the other.

ACTH and Cortisone.

K. B. Mortensen and F. Fischer (*Acta med. scandinav.*, Volume 145, Fasc. 11, 1953) describe the results of treatment of rheumatic fever and rheumatoid arthritis with cortisone and ACTH—18 patients with rheumatic fever and 46 with rheumatoid arthritis. At the time of the study, supplies of cortisone were not plentiful, hence ACTH was used to a larger extent. It was found that small doses of ACTH given intramuscularly (10 international units) repeated four times a day were more effective than a single larger dose. By this means a stronger stimulation of the adrenal cortex was obtained. Smaller doses (five international units) did not cause sufficient adrenal stimulation. The 17-ketosteroids in the urine were increased after the injections, the best result being obtained with the doses of 10 international units four times daily. Clinical improvement did not always correspond to the increase of 17-ketosteroids, though the parallel was fairly close. Clinical results in the case of rheumatic fever were good, with either ACTH or cortisone. Satisfactory results were obtained with salicylates in mild cases, but in severe cases of rheumatic fever ACTH or cortisone was necessary. Although these two preparations produced immediate improvement, they did not prevent heart complications, though the symptoms were relieved, as a rule. The enlarged heart shadow returned to normal in a few days. A secondary rise in temperature occurred in seven out of nine patients treated for seven to fifteen days, but in only one out of nine treated for more than fifteen days. The erythrocyte sedimentation rate did not offer dependable information on the value of treatment given. A follow-up showed mitral disease in three cases, but the treatment may have been insufficient owing to lack of supplies. Other patients, in whom murmurs had been present with enlarged hearts during the illness, showed no signs of disease five to nine months after treatment. Good results were obtained in early cases of rheumatoid arthritis, and less and less satisfactory results in the more chronic cases. The 17-ketosteroids were normal in 80 untreated patients suffering from rheumatoid arthritis, so that there is no basis for an assumption of hypofunction of the adrenal cortex in rheumatoid arthritis. However, the 17-ketosteroid excretion in the urine was increased in most patients in whom a good clinical effect was associated with the use of ACTH and cortisone. Generally, results were beneficial, though relapses occurred sometimes, followed by improvement. The oral dose of cortisone used was from 50 to 100 milligrammes daily. A dose of less than 50 milligrammes was not often effective. In some cases, discontinuance of treatment, even for a day or two, was followed by relapse. Ill effects were of no particular significance. Moonface, acne, pigmentation, rise in blood pressure, palpitation, glycosuria, and other effects soon disappeared when treatment was suspended for a time. Potassium deficiency was rare with cortisone. The eosinophile cell count might or might not fall under treatment with ACTH or cortisone. If it did fall, it often rose again above normal after one week's treatment. Generally, the authors regard the use of ACTH or cortisone as a bold experiment.

Hyperthyroidism.

H. M. Thomas (*New England J. Med.*, April 30, 1953) discuss the treatment of hyperthyroidism. He states that, firstly, pre-operative treatment with an antithyroid drug, followed by thyroidectomy in skilled surgical hands, gives excellent results. Myxœdema, persisting hyperthyroidism, tetany and recurrent laryngeal nerve palsy occur in 3% to 4% of cases. Long-term treatment with an antithyroid drug comes second. Thiouracil and its allies are effective in only 50% of cases. N-propyl-thiouracil and methyl-mercaptoimidazole ("Tapazol") are the most effective drugs. In 1930 Thompson *et alii* reported recovery in nine out of 24 patients treated with iodine alone. Thirdly, radioactive iodine (I^{131}) given by mouth, 100 to 200 microcuries per estimated gramme of thyroid tissue, is said to be effective in a few days or weeks. The gland becomes larger and the patient more toxæmic for some days or weeks, but 75% become non-toxæmic in some months. In 15% of cases a second dose is required, and in 10% a third dose. Treatment extends

over four to six months. Complications may develop, such as carcinoma, myxœdema, persisting hyperthyroidism and resistance to treatment in those who have had iodine. The preparation is not always available, and the technique is not fully worked out. Surgical operation and medical treatment with propyl-thiouracil appear to be the best methods at present.

NEUROLOGY AND PSYCHIATRY.

Patients' Attitude to Leucotomy and its Effects.

E. STENGEL (*J. Ment. Sc.*, July, 1952) discusses the attitude to leucotomy of 206 schizophrenics and depressives. About one-seventh denied having had the operation. When these were told of the occurrence of the operation, some continued to deny it while others accepted it with the attitude of patients with euphoria. This group was one of advanced schizophrenics. In the other group the awareness of losses as contrasted to gains from the operation, for example, lack of energy, was much more frequently complained of by those who recovered or who were greatly improved than by those who were not so relieved. A peculiar attitude of detachment was noted with which the patients recorded their gains or losses. It is considered that this is not altogether a quantitative change, but as a result of the operation the patient is unable to match present and past patterns of emotional responses. In none of the patients had the operations become a source of a delusional idea or the focus of hypochondriacal preoccupations.

The Schizophrenic Reaction with Psychopathic Features.

H. KAPLAN (*Arch. Neurol. & Psychiat.*, August, 1952) describes a study of a group of patients suffering from schizophrenia with psychopathic features. These patients had predominantly the "fundamental" symptoms of schizophrenia (disorders of affect, association, ambivalence) and less often the "accessory" symptoms (delusions, hallucinations). The former are present at all stages of the disease. The patients showed no deterioration, but were frequently in hospital because of their failure in adaptation. With all types of recognized treatment results were uniformly poor, and the author is of the opinion that psychopathic trends in schizophrenia adversely affect the prognosis. However, the "psychopathic defence" reaction utilized by this type of patient in itself prevents deterioration.

Tactile Localization Demonstrated After Leucotomy.

A. ELITHORN, M. F. PIERCY AND M. A. CROSSKEY (*J. Neurol., Neurosurg. & Psychiat.*, November, 1952) undertook studies of tactile localization on the fingers of patients before and after prefrontal leucotomy. Although the frequency of gross errors was increased post-operatively, similar errors were made before the operation, and it was concluded that the operation impaired an imperfect skill in an essentially non-specific manner. The incidence of errors and the direction in which stimuli were erroneously referred were found to depend on the site stimulated. Thus the distribution of errors resulting from the subject's indicating the wrong finger (finger errors) was different from the distribution of errors resulting from the subject's indicating the wrong side of the finger (side errors). This suggests that the subject decides separately which finger and which side of a finger is stimulated. Further, the direction of referral of finger error is positively related to the side of the finger stimulated, and the direction of referral of side errors is similarly related to the side of the hand stimulated. This result has been interpreted as a confusion on the part of the subject between two standards of reference or "concepts", the side of the finger stimulated and the side of the hand stimulated. The authors state that these observations are consistent with the hypothesis that normal tactile localization in man occurs through the intermediary of certain dimensions of orientation or concepts.

Incidence of Epilepsy following Cranio-Cerebral Injury.

C. WESLEY WATSON (*Arch. Neurol. & Psychiat.*, December, 1952) reports the results of a detailed *questionnaire* sent to 500 otherwise heathy men who had suffered head injuries in military service. In 286 suitable data were obtained for analysis, and the follow-up was made three years after the patients were known to have suffered a penetrating head injury. The author sets out tables summarizing his results. He found that the incidence of epilepsy three years after penetrating head injuries among 286 healthy adults was 41·6%; 83% of the patients continued to have seizures three years after their injury. The author discusses the factors affecting the incidence of post-traumatic epilepsy and states among other things that hereditary predisposition did not seem to play a part in these cases and the genetic hypothesis was generally unsupported by his observations.

Thoracic Intervertebral Disk Prolapse.

VALENTINE LOGUE (*J. Neurol., Neurosurg. & Psychiat.*, November, 1952) describes 11 cases in which spinal cord compression occurred with central thoracic disk protrusions and discusses the clinical features, pathology and surgical features. This type of prolapse is apparently confined to the lower nine disk spaces without any particular level predominating. It is commoner in men of middle to late adult life and has little relationship to trauma. The clinical features were not characteristic, but were those of fairly rapidly progressive spinal compression. Three patients presented with incomplete Brown-Séquard syndromes. Pain was an infrequent symptom and was local or radicular. Sphincter disturbance occurred late and was present in less than half the cases. Five patients showed manometric spinal block with a high protein level in the cerebrospinal fluid, but the important feature was the number of patients with only a slight rise of protein level or little evidence of block. X-ray changes formed the important diagnostic guide. Calcification of the *nucleus pulposus* was shown in eight cases, but the authors state that the calcified disk is not necessarily strictly related to the level of the prolapse. Nuclear calcification in the thoracic region is indicative of a degenerative change of such a nature as to render the disk liable to prolapse, but the change may be present in other disks as yet uncalcified and it may happen that the prolapse occurs from one of the latter. The typical myelographic appearance was an oval filling defect, although complete or partial block may occur. The pathological basis of interference with cord function produced by small protrusions is discussed. It is suggested that interference with blood supply probably accounts for the great part of the pathological state. Operation results are reviewed, and some details of surgical technique are stressed.

The Ætiology and Analysis of Acalculia.

F. GREWEL (*Brain*, Volume 75, Part 3, 1952) contributes some observations on the ætiology and analysis of acalculia. He states that arithmetical calculation is such a complex process that a simple cortical functional localization is difficult, and that the study of acalculia requires a knowledge of modern psychology. With the study of aphasia and acalculia it is evident that there is no involvement of a sole biological function, but a disturbance of acquired cultural patterns in an individual patient, that is, interference with the language system, graphic notation system and calculating system. The author states further that the study of these abnormalities requires close cooperation between neurology, sociology and cultural anthropology. He speculates on the relationship between mental make-up and bodily constitution, pointing out that the concurrence of finger agnosia and acalculia is interesting, because counting probably originated in pointing and the use of the "digits". Finally, the author considers that acalculia together with other similar psychological disturbances may be explained by a shortage of the faculties of relating, correlating and symbolizing, as well as of the semantic faculty, and when the higher intellectual faculties are impaired, one is faced with asymbolic and asemantic disturbances.

Adrenocortical Function in Multiple Sclerosis.

J. A. GARCIA-REYES, D. JENKINS, P. H. FORSHAM AND G. W. THORN (*Arch. Neurol & Psychiat.*, December, 1952) undertook to evaluate the level of adrenocortical activity in ten patients presenting classical clinical pictures of long-standing multiple sclerosis. They discovered that the initial state of the adrenocortical function was below normal, but consistent with that of patients suffering from any chronic illness. They report no evidence to support the theory that the pathological processes of multiple sclerosis in the central nervous system interfere with the hypothalamic-anterior pituitary-adrenal cortex system. Therefore they conclude that if adrenocortical hormone therapy is to be tried in cases of multiple sclerosis, it should be carried out at pharmacological levels and that it should be continued for prolonged periods.

Special Articles for the Clinician.

(CONTRIBUTED BY REQUEST.)

LXXXIV.
MISCARRIAGE.

IT is generally stated that approximately 15% of all pregnancies end in spontaneous miscarriage. If that figure is accepted as being substantially correct, and I believe it is, then the wastage in this country is something like 30,000 babies each year. This is an alarming figure in a country whose policy is one of rapid increase in population.

The term "miscarriage" is taken to mean the death of, or expulsion of, the products of conception before the twenty-eighth week of pregnancy.

The subdivision of miscarriage into early miscarriage and late miscarriage is necessary, as the ætiology and management of the two groups are often entirely different. To be more specific, the suggested subdivision of miscarriage should be as follows: (i) early miscarriage: death or expulsion of the fœtus up to the fourteenth week of gestation; (ii) late miscarriage: death or expulsion of the fœtus from the fourteenth to the twenty-eighth week of gestation.

CAUSES OF MISCARRIAGE.

The suggested causes of miscarriages are legion and it is customary to group them under three headings: (i) fœtal causes, (ii) paternal causes, (iii) maternal causes. These causes must to some extent overlap, and while in general principle the classification is useful, it is proposed to discuss them under the headings of early and late miscarriage.

Causes of Early Miscarriage.

Maldevelopment of the Ovum.

The actual cause of faulty development of the ovum is difficult to define, but the following factors are suggested: (i) Errors of implantation in the early decidua are one factor. (ii) A defective spermatozoal picture shown by semen analysis is a more common cause than is generally considered. (iii) Nutritional errors are relatively common, and it is a well-established fact that a properly balanced diet is essential for perfect development of the fœtus. (iv) Bacterial toxin may cause miscarriage, although the clinical condition produced in the mother may be relatively mild—for example, influenza, rubella and some of the other virus diseases may be mentioned in this group.

Abnormalities of the Uterus.

Gross abnormalities of the uterus are an obvious cause of early miscarriage, but the less obvious ones should be considered.

Uterosalpingography may reveal a subseptate or arcuate uterus or a small submucous fibroid tumour.

Genital hypoplasia is generally considered a common cause of early miscarriages. It has always seemed unlikely to me that the girl whose menarche occurs at the normal age, who menstruates regularly and normally and becomes pregnant easily should miscarry because of genital hypoplasia. The girl of today takes her pregnancy "in her stride", and, unless specifically advised, does not limit any of her activities, social, athletic or marital. While this attitude is in general good, some limitation may be necessary until full development of the placenta.

Endocrine Dysfunction.

Women with obvious endocrine stigmata tend to be of low fertility and are more likely to miscarry should they become pregnant. The role of progesterone and the œstrogens in the maintenance of normal pregnancy seems to be well established.

The *corpus luteum* is the probable source of these hormones in early pregnancy, the role of the *corpus luteum* being gradually taken over by the chorionic epithelium.

At about the sixty-eighth day of pregnancy the *corpus luteum* rapidly retrogresses, and if the supply of œstrogens and progesterone from the chorionic epithelium is inadequate, miscarriage may occur.

Laceration of the Cervix.

Deep laceration of the cervix may cause miscarriage. Surgical repair of the laceration may itself result in miscarriage or premature labour, so that repair is not wise unless there have been repeated miscarriages for which no other cause can be found.

Retroversion of the Uterus.

The mobility of the uterus is the important factor in retroversion. A fixed retroverted uterus will certainly cause early miscarriage. The role of the mobile retroverted uterus is more debatable, but in my opinion it is a cause of miscarriage, not so much by its position as by the pelvic congestion or ovarian dysfunction which it may produce.

A woman who has had more than one miscarriage, and in whom an uncomplicated retroversion is found, should be advised to have the position corrected. Utero-salpingography should be carried out prior to operation, to establish tubal patency.

Chronic Illness in the Mother.

Chronic illnesses in the mother as causes of miscarriage are well known, and include such conditions as *diabetes mellitus*, renal disease, active tuberculosis, cardiac insufficiency, syphilis *et cetera*.

Properly controlled diabetes should not cause early miscarriage, and the other conditions mentioned are more a cause of late miscarriage or premature labour.

Emotional Disturbance.

It is possible that severe emotional disturbance may produce miscarriage. This factor becomes much more potent in women who have had repeated miscarriages.

It seems to occur when menstruation would have been due in the absence of pregnancy.

Trauma.

The role of accidental trauma as a cause of early miscarriage is difficult to decide. Excessive sexual intercourse in early pregnancy seems to be a factor.

The Pathology of Early Miscarriage.

The immediate cause of the miscarriage is usually hæmorrhage into the chorio-decidual space—that is, retroplacental hæmorrhage. Uterine contractions are initiated and the ovum is expelled. In early miscarriage part of the developing placenta is usually retained—that is, the miscarriage is incomplete.

Clinical Types of Early Miscarriage.

In the early weeks of pregnancy the developing ovum lies embedded in the decidua and covered by the *decidua capsularis*. The *decidua capsularis* does not fuse with that lining the cavity of the uterus—the *decidua vera*—until about the twelfth week of pregnancy, so that a space—the decidual space—is present. Bleeding may occur from this space without any disturbance to the pregnancy. Many women have more or less cyclical bleeding during the first twelve weeks of their pregnancy, and the diagnosis between this condition and threatened miscarriage is impossible in the early stages. When a pathological process is initiated, the following clinical conditions may result: (i) threatened miscarriage, (ii) inevitable miscarriage, (iii) complete miscarriage, (iv) incomplete miscarriage, (v) intrauterine death of the ovum without expulsion (that is, missed abortion), (vi) septic miscarriage.

Clinical Signs and Treatment of Early Miscarriage.

When one is confronted with a case of vaginal bleeding, it is useful to ask oneself the following questions: (i) Is the woman pregnant? (ii) Is the pregnancy intrauterine or extrauterine? (iii) If the pregnancy is intrauterine, are signs of miscarriage present?

A detailed history and a careful examination including bimanual palpation of the pelvic organs and examination with a vaginal speculum usually enable an accurate diagnosis to be made.

Threatened Miscarriage.

The amount of bleeding varies, but is generally slight. Pain is slight, being usually felt as lower abdominal discomfort. Bimanual examination establishes the size of the uterus and the presence or absence of uterine contractions. The internal os remains closed. The patient is confined to bed and a sedative is given; pethidine hydrochloride, 100 milligrammes given intramuscularly, is satisfactory. This may be followed by half a grain of sodium phenobarbital three times daily by mouth. Progesterone (five milligrammes) is given by intramuscular injection twice a day and is combined with stilbœstrol (one milligramme daily) given by mouth. A low residue diet is given and the bowels are kept

open by a mineral oil or glycerine suppository. In the favourable case the bleeding will gradually stop, but the patient should be kept in bed for seven days after cessation of bleeding. A brown discharge may continue for weeks without the development of other unfavourable signs. The increase in size of the uterus or a biological test will confirm the continuation of the pregnancy. Should the bleeding increase after rest and treatment or recur in appreciable amount when the patient is allowed out of bed, then the miscarriage should be regarded as inevitable, as further conservative treatment only postpones the evil day.

Inevitable Miscarriage.

The clinical signs of inevitable miscarriage are usually definite. Bleeding is considerable in amount. Pain is present, cramp-like in character, the pains coinciding with uterine contractions. Bimanual examination reveals dilatation of the internal os, which usually admits one finger, and also the enlarged pregnant uterus. When the diagnosis of inevitable miscarriage has been made, the next step is to decide whether the miscarriage is complete or incomplete. This may be impossible immediately unless any material passed has been kept and the medical attendant can satisfy himself that the whole of the products of conception have been expelled.

It is probably wiser to treat an early miscarriage as incomplete and surgically empty the uterus, provided that no signs of infection are present. The patient is given appropriate chemotherapy and antibiotic treatment prior to and for a day or so after operation. The cavity of the uterus is explored with ovum forceps to remove as much of the ovum as possible, and this is followed by gentle curettage with a blunt curette. The blunt flushing curette is very useful.

When the uterus is empty, it is brought into an anteverted position and firmly massaged, and an injection of ergometrine (0·5 milligramme) or "Pitocin" (10 units) is given. Should the uterus remain soft and bleeding continue, the cavity is packed with gauze soaked in acriflavine and glycerin. The packing is removed in six hours. Blood transfusion may be necessary before or after operation.

Complete Miscarriage.

In complete miscarriage examination of material expelled should show the whole of the products of conception. Bleeding ceases quickly, the cervix becomes closed and the uterus is firm and relatively small. The only treatment necessary is bed rest for a few days and the oral administration of ergometrine, one milligramme twice daily.

Incomplete Miscarriage.

The majority of early miscarriages are incomplete. The immediate diagnosis may not be easy, particularly when the patient is not examined until a day or two after the initial hæmorrhage. On pelvic examination the uterus is enlarged and soft and the cervix admits the tip of the finger. Speculum examination may reveal fragments of material protruding through the cervix. The treatment is surgical evacuation of the contents of the uterus, provided there are no signs of infection.

Conservative treatment of these patients is unsatisfactory, and it is not unusual to see women who have had slight bleeding for weeks with a hæmoglobin value of 50% to 60%.

Blood transfusion is essential before operation is undertaken in these cases.

Missed Abortion.

The immediate diagnosis of missed abortion is not easy. The initial bleeding tends to cease and is followed by a brown discharge. The uterus does not increase in size. The cervix remains closed. The secondary signs of pregnancy may disappear. Time is necessary for a positive diagnosis to be made.

A biological test is helpful, but the result may remain positive for two weeks after the death of the ovum. Once a diagnosis has been made, the uterus should be emptied surgically. Treatment with large doses of œstrogen and graded amounts of "Pitocin" is not effective in the missed abortion. If the uterus is not enlarged more than a twelve weeks' pregnancy, dilatation of the cervix with dilators and evacuation of its contents with ovum forceps and blunt curette are suitable. When the uterus is enlarged more, the insertion of two or three seatangle tents into the cervix for twenty-four hours gives very good dilatation and makes the emptying of the uterus easier and safer. The tents are sterilized by immersion in absolute alcohol for twenty-four hours. Chemotherapy and antibiotic treatment are commenced prior to operation.

Septic Miscarriage.

The term "septic miscarriage" implies the association of the signs of miscarriage with those of infection. The signs of infection vary greatly according to the infecting organisms, and a vaginal smear should always be taken for cultural examination. The sensitivity of the organism to antibiotics should be determined. The first step in treatment is to commence the appropriate chemotherapeutic and antibiotic measures. A satisfactory combination of antibodies is penicillin and aureomycin. A vaginal speculum should be passed and any material protruding through the cervix may be removed gently with sponge forceps. The hæmoglobin value is determined. Blood transfusion may be necessary. General nursing is important for the seriously ill patient. This conservative treatment is continued until the patient has been afebrile for one week, when surgical evacuation of the contents of the uterus is undertaken. Severe bleeding may interfere with this conservative treatment and make evacuation of the contents of the uterus imperative. A sharp curette should never be used in these cases, and extreme gentleness is essential.

Causes of Late Miscarriage.

The following diseases in the mother may cause late miscarriage: (*a*) renal disease, (*b*) severe hypertensive disease, (*c*) *diabetes mellitus* and the pre-diabetic state, (*d*) cardiac insufficiency, (*e*) chronic respiratory disease—for example, bronchiectasis, (*f*) syphilis, (*g*) acute febrile illness.

Pregnancy toxæmia also may cause late miscarriage. It is unusual before the twenty-eighth week unless it is complicating renal disease or hypertension, but it may occur particularly with twin pregnancy.

Other causes of late miscarriage are the following: (i) premature rupture of the membranes, (ii) hydramnios, which may be associated with fœtal abnormality, (iii) rhesus incompatability, (iv) fœtal abnormality, (v) uterine irritability, (vi) disease of the uterus—for example, fibroid tumours, laceration of the cervix, (vii) trauma.

The causes of late miscarriage are more definite than those of early miscarriage, and by early diagnosis and treatment combined with meticulous ante-natal care it is often possible to prevent the early termination of the pregnancy. It is beyond the scope of this article to discuss all these causes and their treatment, but two of them may be mentioned.

Premature Rupture of the Membranes.

In the woman with no obvious disease, premature rupture of the membranes is probably the commonest cause of late miscarriage or premature labour. It occurs predominantly in the *multipara* with a fair-sized family, and usually in the poorer class.

The problem of prevention is dietetic and economic. These patients' diet is generally inadequate in protein and the accessory factors, and they are occupied from daylight to dark with the demands of house, husband and a large family.

Uterine Irritability.

Uterine irritability is best illustrated by a case history.

> Mrs. T. lost her first baby at twenty-four weeks. Complete investigation revealed no cause for her miscarriage. She has had four further pregnancies, all terminating between the twenty-fourth and twenty-seventh weeks, in spite of all known methods of treatment. The method of termination has been the same in each pregnancy. The first sign is lower abdominal discomfort which increases, and after about eight hours the unruptured membranes are visible at the vulva, and shortly afterwards the fœtus is expelled. The baby lives for a few hours. Post-mortem examination reveals no abnormality. Histological examination of the placenta reveals no abnormality.

In a similar case in which four previous miscarriages had occurred, vitamin B_6 and B_{12} in addition to the usual treatment for habitual miscarriage has been used in the present pregnancy. This pregnancy has now reached the thirty-fifth week.

Treatment of Late Miscarriage.

In the majority of cases the fœtus is expelled and is followed by the placenta. Should the placenta be retained, the treatment depends on the duration of the pregnancy. If the fœtus has been small, it may not be possible to reach the placenta with a finger passed through the cervix. Ovum forceps and a blunt curette then have to be used.

The danger of this latter method is that in spite of all care a fragment of placenta may be left in the uterus. This is often expelled spontaneously, but further curettage may be necessary for prolonged bleeding.

In late miscarriage, if the placenta is retained, there is usually no difficulty in separating it with the fingers and removing it manually.

Intrauterine Death and Retention of the Fœtus.

It is true that without treatment the contents of the uterus will sooner or later be expelled spontaneously; but this desired result may not occur for many weeks, and the psychological effect can be and often is unfortunate.

Medical methods of stimulating the uterus to active contraction are worth a trial. The patient is given stilbœstrol, 10 milligrammes, by mouth, two hourly for 10 doses. This is followed by "Pitocin". The intravenous drip administration of "Pitocin" is a useful method. "Pitocin", 10 units, is added to one litre of 4% glucose solution. The drip should run at the rate of 30 drops per minute. Should this procedure fail, it may be repeated after twenty-four hours. Further failure necessitates surgical treatment.

Surgical Method.

The patient is anæsthetized and placed in the lithotomy position, and the usual antiseptic preparation of the vulva and vagina is carried out. The bladder is emptied. Three medium-sized seatangle tents are placed in the cervix. The end of the tents must pass beyond the internal os. The vagina is lightly packed with gauze and the patient is returned to bed.

The presence of the tents in the cervix produces dilatation and in addition active contractions of the uterus. In many cases the tents together with the contents of the uterus are expelled within twenty-four hours. Should expulsion not occur, the tents are removed.

The cervix will be found to be dilated sufficiently to admit two to three fingers. The membranes may now be ruptured, the fingers passed through the cervix and a leg pulled down.

Small doses of "Pitocin"—two units half-hourly—may be given until active contraction of the uterus begins. The expulsion of the fœtus and placenta is usually rapid and complete. A chemotherapeutic and antibiotic "cover" is given during this surgical treatment.

Habitual Miscarriage.

The name habitual is applied to the condition in which a woman has had three consecutive miscarriages and full investigation has revealed no obvious cause.

Treatment.

The suggested methods of treatment are legion, and extravagant claims have been made for this or that method.

It is desirable to examine these patients before they attempt a further pregnancy. Time should be spent in gaining their confidence, as their outlook is understandably pessimistic, and in improving their general health.

When they become pregnant the following regime is suggested. (i) Bed rest should be instituted for seven days when menstruation would have been occurring. (ii) Mild sedation is required—half a grain of sodium phenobarbital morning and night. (iii) Progesterone, 10 milligrammes, should be given by intramuscular injection once a week. (iv) Stilbœstrol, one milligramme daily, should be given by mouth. (v) Heavy work is prohibited, and sexual intercourse is undesirable. (vi) The diet should contain large amounts of first-class protein, and methionine (two grammes daily) is added. "Pentavite" is given in a dose of 15 minims twice daily, together with iron and calcium.

It is difficult to assess the effect of any form of treatment in these cases, but perhaps rest, confidence and diet are the most important factors in management.

W. F. JOYNT,
Adelaide.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held at the Alfred Hospital, Melbourne, on May 6, 1953. The meeting took the form of a series of clinical demonstrations by members of the medical and surgical staff of the hospital.

Clinical Research Unit Demonstration.

Three demonstrations were given by members of the Clinical Research Unit of the hospital.

DR. T. E. LOWE, the director, showed charts and case histories illustrating the use of posture in the treatment of œdema. These indicated the value of nursing patients in the sitting posture with the legs down during the acute phase of cardiac congestive failure. Dr. Lowe said that after diuresis had become well established, that posture should be changed to a sitting position in bed; sometimes, if the change was not made, the œdema remained in the legs below the knees. He referred to one subject of generalized œdema from a nephrotic syndrome in whom the œdema was resistant to treatment until the lower limbs were elevated to a considerable height above the bed.

DR. BRYAN HUDSON showed two patients suffering from osteomalacia with chronic renal disease. Both patients had acidosis and were unable to excrete an acid urine. In one case calcium balance studies were performed, with demonstration of a significant calcium-retaining effect of alkali solution and vitamin *B*.

DR. A. J. BARNETT discussed the problem of peripheral vascular thrombosis with particular reference to ætiological diagnosis and management. He showed four patients, one suffering from recurrent arterial thrombosis and three suffering from venous thrombosis.

The first patient, a man, aged forty-nine years, had suffered attacks of thrombosis of each popliteal artery on two successive nights. He had been treated with continuous intravenous heparin therapy and lumbar sympathectomy. Several weeks later he had developed a thrombosis of the superficial femoral artery and was at present under treatment with ethylidene dicoumarol. The second patient, a man, aged fifty years, had developed several attacks of venous thrombosis after cardiac infarction. Those had occurred in spite of anticoagulant therapy. The third patient, a woman, aged forty-six years, had had several attacks of venous thrombosis over a period of a year in spite of anticoagulant therapy. An ovarian tumour (carcinoma) was later discovered. That was removed, and since then she had had no further thrombotic episode. The fourth patient, a woman, aged sixty-five years, had presented herself for treatment because of a swollen leg due to spontaneous thrombosis of her common iliac vein. Examination of the patient revealed enlarged lymph glands in the neck, axillæ and groins. Biopsy of a gland was performed, and giant folliculoma was found. Dr. Barnett made the comment that the last two patients showed the importance of a search for an underlying neoplastic condition in the presence of recurrent venous thrombosis.

Gastro-Enterological Demonstration.

DR. P. J. PARSONS presented four patients suffering from gastro-enterological conditions, making special reference to the use of gastroscopy in diagnosis and management. Gastroscopy was performed on one of the patients to illustrate some of the points raised. The first patient, a man, aged sixty-seven years, had three months previously had an attack of typical ulcer dyspepsia lasting for a few days. He had had two similar previous attacks six months and eighteen months earlier, the attacks lasting about a week on each occasion. He had had no loss of weight, his appetite was excellent, and he was completely free from symptoms. His hæmoglobin value was 100%. Fractional test meal examination showed free acid to be present up to 40%. Barium meal examination on January 6, 1953, had shown narrowing of the pyloric antrum over about one and a half inches, and there was a suggestion of the presence of a very small ulcer crater in the pyloric canal, but no obstruction was present. It was considered that carcinoma of the pyloric antrum could not be excluded radiologically, but it was felt that the appearances in the antrum might be due to intense spasm associated with the small pyloric ulcer. Gastroscopy was performed with the Herman Taylor instrument, but owing to the build of the patient and the shape of the stomach it was not possible to visualize the pyloric antrum. Occult blood tests on the stools were carried out on three successive days, but the findings were negative. It was decided to observe the patient for a time, and later to repeat the barium meal examination. The latter was done on March 4, 1953, and the radiological changes were similar to those observed previously. It was thought that as carcinoma of the stomach could not be excluded, laparotomy was advisable. However, the patient was completely free from symptoms, had an excellent appetite, was gaining weight and was reluctant to have an operation, so it was decided to repeat the barium meal examination after a further interval. The repeat examination was made on April 8, 1953, and similar changes in the antrum were again observed; injection of one one-hundredth of a grain of atropine while the patient was on the operating

table was followed by two radiologically visible peristaltic waves reaching the pylorus. Dr. Parsons said that the diagnosis would appear to be pyloric ulcer associated with intense spasm of the antrum. If visualization of the antrum had been possible gastroscopically, it would have been very helpful in the exclusion of carcinoma. It was proposed to repeat the barium meal examination in a further three months to follow the progress of the lesion.

The second patient, a woman, aged fifty-two years, had, three months before her admission to hospital, complained of nagging epigastric pain occurring two hours after lunch and lasting until 8 p.m., with no relief from alkalis. The barium meal examination carried out two months after the onset of symptoms had shown no abnormality. A further barium meal examination on January 19, 1953, three months after the onset of symptoms, revealed a small gastric ulcer situated high on the lesser curvature of the stomach towards the posterior wall. The patient was subjected to a rigid ulcer regime in hospital with bed rest, two-hourly feeds, full alkalinization, administration of tincture of belladonna up to 50 minims three times a day, and intragastric drip administration of milk at night, but only temporary remission of pain occurred, the longest period being three to four days. Barium meal examination was repeated on March 16, 1953, and the ulcer could not be demonstrated in spite of the fact that pain was still present and there was also localized tenderness. Gastroscopy was performed, but the ulcer was so high on the lesser curve that it could not be seen, even with a Herman Taylor instrument. Symptoms persisted in spite of continuance of the strict ulcer regime in hospital. The fourth barium meal examination a month later again showed no ulcer. Laparotomy was carried out on April 22. When the stomach was opened, a small ulcer crater was seen, one-third of an inch in diameter, three-quarters of an inch from the cardia on the lesser curve of the stomach. Partial gastrectomy was performed (Polyá-Hofmeister type), the ulcer being left *in situ*. Dr. Parsons said that the patient was shown to demonstrate the importance of clinical findings in gastric ulcer, the difficulty in demonstrating a high gastric ulcer radiologically, limitations of gastroscopy in the case of a high lesser curve gastric ulcer, and the choice of surgical procedures available in such a case.

The third patient, a woman, aged sixty years, had for four months complained of intermittent upper abdominal pain relieved by vomiting with remarkably little loss of appetite. During the same period a great deal of weight had been lost, with increase in pallor and loss of energy. On examination, the patient was found to be anæmic, with a hæmoglobin value of 54% and evidence of hypochromic microcytic anæmia, but no mass was palpable in the abdomen nor was there any tenderness or hepatic enlargement. Barium meal examination on April 2, 1953, showed loss of definition and irregularity of outline of the upper third of the lesser curve of the stomach, without evidence of superficial ulceration. The pyloric antrum and duodenum were normal. Gastroscopic examination revealed a slightly nodular irregularity of the upper third of the lesser curve which was just visible, but no ulceration was seen. The clinical diagnosis was carcinoma of the stomach; the radiological and gastroscopic evidence was highly suggestive, although not conclusive. Feeding with a high protein diet was instituted for the next two weeks, and a blood transfusion was given of five pints in all. On April 30 the patient was subjected to laparotomy and a Bilroth I gastrectomy was performed. A hard area measuring one inch by one and a half inches was present high on the lesser curve of the stomach, extending to within one inch of the cardia. No ulceration was present. Histological examination confirmed the presence of an infiltrating adenocarcinoma in the stomach. Dr. Parsons said that the patient was presented to show the difficulties of interpretation of the radiological, gastroscopic and even naked-eye appearances of a non-ulcerating infiltrating small carcinoma of the stomach.

The last patient, a man, aged sixty-five years, had suffered from a perforated duodenal ulcer following a few days of mild dyspepsia seven years previously. Ulcer dyspepsia had recurred after a period of three years and was then mild and intermittent for the next three years, but during the past twelve months the patient had had persistent ulcer pain with severe night pain and no remissions. Examination of the patient showed only moderately good nutrition. Epigastric tenderness was present to the left of the mid-line, and a gastric splash was present three hours after the taking of food. Barium meal examination revealed a duodenal ulcer, and also a lesser curve gastric ulcer about three-quarters of an inch in diameter in the region of the angulus. Gastroscopic examination with a Herman Taylor instrument showed a normal pyloric antrum and the lesser curve gastric ulcer present at the angulus, which had all the characteristics of a benign gastric ulcer; the appearances were demonstrated at the meeting. Dr. Parsons said that the patient was presented to show the gastroscopic appearances of a normal antrum and of a benign gastric ulcer, and as the basis for a discussion on the line of management. Gastrectomy was advised.

Hodgkin's Disease.

DR. JOHN MCLEAN discussed the treatment of a series of patients suffering from Hodgkin's disease. The first patient, a married woman, aged thirty-seven years, had noticed lumps in both axillæ about six years previously. In October, 1947, biopsy of an enlarged gland was performed, and the appearances were reported as those of Hodgkin's disease. X-ray therapy was given at frequent intervals for a period of twelve months. Improvement was temporary and the condition was regarded as refractory to treatment. In February and June, 1949, courses of treatment were given with nitrogen mustard (20 milligrammes) and the glands decreased in size. In August, 1950, the glands again enlarged and a further course of treatment was given with nitrogen mustard (24 milligrammes). Since then the patient had remained well. A small gland in the axilla had not increased in size.

A second patient, a married woman, aged thirty-two years, had noticed a lump on the right side of her neck four years previously. In September, 1950, the lump was excised, and the appearances found on examination were reported as those of Hodgkin's disease. In May, 1951, glands in the neck were enlarged, and a course of nitrogen mustard (25 milligrammes) was given. After treatment the glands could not be palpated and the circumference of the neck had decreased by two inches. Twelve months later the glands in the neck were again enlarged. Further courses of nitrogen mustard (33 milligrammes) were given in October, 1951, and March, 1952. In April, 1953, no glands were palpable.

The third patient, a man, aged sixty-eight years, had had enlarged glands in the neck. Biopsy examination showed the appearances of Hodgkin's disease. Two courses of injections of nitrogen mustard were given in January and July, 1952. The condition became less, but six months later the glands were again found to be enlarged and the skin was very itchy. Treatment was given with triethylene melamine at monthly intervals—a total dosage of 75 milligrammes over a period of five months. The condition lessened, the glands became much smaller in size, and the skin was not itchy. Neutropenia occurred towards the end of the period.

Dr. McLean also presented a case history of a patient suffering from Hodgkin's disease who had not responded to treatment with nitrogen mustard and triethylene melamine.

Bone Marrow Reticulosis.

Dr. McLean gave in brief the histories of three patients suffering from bone marrow reticulosis. They had all severe anæmia of the "aplastic type". Rib biopsy showed in each case replacement of bone marrow by a growth of reticular cells. One patient responded to treatment with nitrogen mustard and had a remission of twelve months, but the other two developed agranulocytosis after treatment, and death was partly due to the toxic effects of the drug.

Hæmorrhagic Conditions and the Thromboplastin Complex.

DR. R. SAWERS, from the hæmatology clinic of the hospital, discussed cases of hæmorrhagic conditions connected with deficiencies of the thromboplastin complex illustrating the multiplicity of "hæmophilia".

In the same connexion, DR. P. FANTL, from the Baker Medical Research Institute, discussed the latest laboratory tests for the diagnosis of hæmorrhagic conditions related to clotting factors involved in the thromboplastin complex.

The Treatment of Asthma.

DR. CHARLES SUTHERLAND showed a series of patients to illustrate methods of treating asthma. Three patients shown illustrated different types of asthma. One was allergic, and reacted strongly to house dust and pollens. Another was not allergic, and gave negative responses to all tests with allergens, but had infective sinusitis with considerable reactivity to bacteria. The third provided no allergic clues, but had nasal polypi and was intolerant to aspirin and had resisted all forms of treatment. Dr. Sutherland also showed

a series of slides summarizing methods of treatment. He said that the most important advances in recent years had been the use of full doses of antibiotics in infective cases, and the use of ACTH and cortisone in cases in which other forms of treatment were resisted.

Congenital Heart Disease.

DR. C. J. OFFICER BROWN showed a series of patients to illustrate the surgical treatment for certain congenital heart diseases. He said that at the Alfred Hospital a total of 295 patients with congenital heart disease had been operated on in accordance with the following classification: patent *ductus arteriosus*, 126 cases with one death; "blue babies", 119 operable cases with 11 deaths, 15 inoperable cases with five deaths, a total of 134 cases with 16 deaths; coarctation of the aorta, 32 cases with two deaths; congenital vascular rings, three cases with no deaths.

The first patient presented was a boy, aged eleven years, who had always been known to have a congenital defect. He was acyanotic and had a loud systolic murmur at the pulmonary area with some congestion of the lung fields and a slightly enlarged heart with a pulmonary conus. The electrocardiogram showed no abnormality. The original diagnosis was a ventricular septal defect. Cardiac catheterization showed a considerable increase in oxygenation of the blood in the pulmonary artery, and it was decided that a patent *ductus arteriosus* was probably present. At operation, a patent *ductus arteriosus* was found and divided.

The next patient was a girl, aged twenty-five years, with a typical machinery murmur whose condition was looked on as a classical example of patent *ductus arteriosus*.

Dr. Brown then showed three patients who had been suffering from coarctation of the aorta. All had presented themselves with a raised blood pressure, absent femoral pulses, visible and palpable anastomotic vessels around the scapular region and the axilla, and X-ray evidence of notching of the ribs. The first, who was aged twenty years, was a powerful young man with exceptional development of his trunk and arms and relatively underdeveloped lower extremities. At operation it had been found impossible to bring the ends of the aorta together after the coarctation had been excised, and in the absence of a graft, the subclavian artery was ligated, turned down, and anastomosed to the distal part of the aorta. The blood pressure in the right arm had fallen from over 200 millimetres of mercury down to 160 millimetres. The femoral pulse was easily palpable and synchronized with the radial pulse, and the pulses at the ankles were readily palpable. The blood pressure in the lower limbs was recorded at 100 millimetres of mercury. It was thought that the patient would have considerable improvement, but the operation was not so satisfactory as direct anastomosis. The second patient of the coarctation group was a boy, aged eleven years, whose coarctation had been excised with direct suture; his circulatory system now appeared to be completely normal. The other member of the group was a boy, aged twelve years, whose coarctation had been discovered at a routine school medical examination. His blood pressure was 150 millimetres of mercury, systolic, and 80 millimetres, diastolic. His heart was showing some evidence of strain and operation was to be performed. Dr. Brown said that he considered that patients with coarctation of the aorta should be operated on if possible between the ages of eight and ten years, because at that age the aorta was probably sufficient to see the patient through life even if the anastomosis did not grow with the aorta. It was felt that anastomoses almost certainly did grow provided that the operation was performed with uninterrupted sutures as was the practice at the Alfred Hospital. For patients under the age of eight or nine years, operation was indicated if there was any evidence of heart strain or if the child was not developing satisfactorily. In such young children, the use of interrupted sutures was considered essential. A graft should not be used until the aorta was sufficiently large to provide a satisfactory flow throughout life, because it was certain that a graft did not enlarge as the patient grew older.

Dr. Brown then showed two patients who had been operated on for Fallot's tetralogy five years previously. In both cases, a Willis Potts pulmonary aortic anastomosis had been performed. Both patients had been extremely cyanosed at the time of the original operation, with hæmoglobin values of 188% and 172% respectively. Both had completely lost their cyanosis and clubbing, and both were living normal active lives at school. However, X-ray examination showed considerable enlargement of the heart with much congestion of the lung fields, and it was felt that the ultimate outlook was not very encouraging. Dr. Brown also showed a third child, aged five years, with Fallot's tetralogy and gross cyanosis and clubbing, on whom operation was planned in the future.

The last patient shown by Dr. Brown was a boy, aged eleven years, who had come to the hospital suffering from gross cyanosis and clubbing and great restriction of activity. X-ray examination showed complete transposition of the viscera, but the aorta was left-sided. The boy's lung fields appeared to be normal. Angiocardiography showed the presence of a pronounced venous arterial shunt (left to right), and the aorta was visualized at the same time as the pulmonary artery in the second film taken. A catheter passed into the left atrium did not go into the right atrium, but when it was passed into the left ventricle its tip passed through into the right ventricle and so into the aorta. It could not be passed through the pulmonary orifice. An anterior incision was made into the right side; when the pericardium was opened the aorta was found to be anterior and to the right and the pulmonary artery posterior and to the left, and pulmonary valvular stenosis was recognized. The incision was prolonged transversely across the sternum, and pulmonary valvulotomy was carried out. Convalescence was uninterrupted, and at the time of demonstration, three weeks after operation, cyanosis was almost absent and exercise tolerance appeared to be increased.

Cardiospasm.

DR. K. N. MORRIS showed a series of patients to illustrate the condition of cardiospasm of varying degrees of severity. The majority of the patients had been treated by Heller's operation with satisfactory results. Dr. Morris said that Heller's operation consisted of a longitudinal incision in the muscular wall of the œsophago-gastric junction without opening of the mucosa. It was most conveniently performed through a thoracic incision. The results had been completely satisfactory in the series of cases represented at the meeting.

Ulcers of the Leg.

DR. ROBERT S. LAWSON showed a series of patients to illustrate methods used in the treatment of intractable ulcers of the leg. The methods were venous ligation, lumbar sympathectomy and skin grafting.

Rectal Bleeding.

DR. JAMES GUEST showed a series of patients whose presenting symptom had been rectal bleeding. The first was a woman, aged thirty-seven years, who had had a two years' history of constipation and a feeling of unsatisfied defæcation. For seven months she had been passing slimy liquid stools—sometimes fluid fæces, at others a mixture of blood and mucous, and occasionally clear mucus. Dr. Guest stressed that the patient's story was a typical presenting picture associated with a villous tumour of the rectum. In the patient's case, the tumour was large and sessile, was situated low down in the rectum and had undergone malignant change at its base. A synchronous combined abdomino-perineal resection of the rectum was performed.

The second patient, a man, aged seventy years, had had recurrent attacks of pain under the left costal margin for twelve months associated with the occasional passage of dark blood *per rectum*. Examination of the patient revealed a small mass palpable to the left of the umbilicus. On sigmoidoscopic examination, a pedunculated adenoma was found about one centimetre in diameter, at a distance of 13 centimetres from the anal orifice. Barium clysma revealed a polypoid neoplasm in the descending colon, with a large base suggesting that it was probably malignant. After suitable bowel preparation, the rectal polypus was dealt with by a diathermy excision. At laparotomy, a small carcinoma of the descending colon was found. That was excised, and primary anastomosis was performed. The operation specimen, which measured 38 centimetres in length, was found to contain a small polypoid carcinoma and four very small adenomata. The carcinoma was obviously due to malignant change in a preexisting adenoma.

The third patient, a young man, aged seventeen years, had had a five days' history of vague central abdominal pain associated with the passage of moderate amounts of dark blood *per rectum*. Just prior to his admission to hospital, the patient had had a severe attack of central abdominal pain. When he was examined he was in a severely shocked state and was passing copious amounts of bright red blood *per rectum*. His hæmoglobin value was 38%. Blood transfusion was given, and a laparotomy was performed. The bleeding was found to be due to two large gastric ulcers in a Meckel's diverticulum, which was resected. The patient made an uneventful recovery.

The last patient, a man, aged fifty-seven years, had had a twelve months' history of increasing constipation associated with occasional attacks of diarrhœa and passage of blood *per rectum*. He was found to be suffering from carcinoma of the rectum with its lower border ten centimetres from the anal orifice. This was treated by anterior resection and anastomosis. Dr. Guest discussed the place of restorative resection in the treatment of rectal carcinoma.

Radiological Demonstration.

In a demonstration prepared by members of the X-ray department of the hospital, DR. B. L. DEANS discussed cases of lung trauma associated with accidents, DR. H. A. LUKE discussed a case of pneumopericardium with a review of the literature, and DR. B. TAFT discussed a series of films from a case in which syphilitic changes were found in the lungs and the skeletal pelvis. Reports of the cases discussed by Dr. Luke and by Dr. Taft are being prepared for publication.

Ophthalmic Demonstration.

DR. W. M. BOX presented three patients who had been treated for congenital ptosis by means of *fascia lata* grafts (Lexer's operation). He also showed a patient with conical cornea who had been treated with contact lenses. The patient's visual acuity had improved from 6/60 to 6/9, and the patient was able to wear the contact lenses for twelve hours at a time. Dr. Box lastly showed a patient with opaque nerve fibres of considerable degree in both eyes, and a patient with probable benign melanoma of the choroid.

DR. HADDON H. JOHNSON presented a patient with hypertensive retinopathy and a patient with juxta-papillary choroiditis of probably tuberculous ætiology. He also showed a patient with an epithelial implantation cyst in the anterior chamber following cataract extraction, who was under treatment with deep X-ray therapy.

DR. P. H. COWEN presented a series of patients suffering from diabetic retinopathy of both hæmorrhagic and exudative types. He also showed three patients suffering from syphilitic choroido-retinitis in which the distribution of pigment resembled *retinitis pigmentosa*.

Medical Societies.

THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A MEETING of the Medical Sciences Club of South Australia was held in the Anatomy Theatre, New Medical School, Frome Road, Adelaide, on May 1, 1953.

Chromatographic Techniques.

The meeting took the form of a symposium on chromatographic techniques.

Paper-Chromatographic and Radioisotopic Techniques.

PROFESSOR W. P. ROGERS dealt with the subject of the complementary use of paper-chromatographic and radioactive isotope techniques. He said that in addition to conventional chemical methods, substances labelled with radioactive isotopes could be detected on paper chromatograms by the preparation of autoradiographs or by the use of a scanning device with a Geiger counter. The former method had the advantage that it gave an integrated picture of the distribution of the labelled material, but it was not as sensitive as the latter method. It was most suitable for use with two-dimensional chromatograms. The method had several advantages when used for the study of specific metabolic pathways, for example, the study of ^{131}I metabolism of the thyroid gland, or the incorporation of $^{14}CO_2$ into trioses, hexoses and organic acids during photosynthesis. It had also been used as a method of examining the purity of labelled materials.

Sugar and Sugar Derivatives.

DR. L. FRAHN dealt with sugar and sugar derivatives in relation to paper chromatography.

Separation of Organic Acids.

MR. J. M. LADD and DR. P. M. NOSSAL said that the separation of organic monocarboxylic, dicarboxylic and tricarboxylic acids was of importance because of the role those substances played in intermediary metabolism. They described three chromatographic techniques used to determine the optimum conditions for separating mixtures of acids.

Alterations in Serum Proteins in Diseases.

MRS. J. B. PATON said that in 1950, Durrum had shown that by applying an electric potential across the ends of strips of filter paper saturated with buffer, mixtures of proteins, peptides or amino acids could be separated into narrowly defined areas. Under those conditions proteins behaved as if in solution and results were comparable with those obtained by electrophoresis. That had proved particularly useful because many protein mixtures could not readily be separated by other means. The proteins could be fixed on the paper by heat denaturation and then stained, or each fraction could be eluted and used for other purposes. Flynn and de Mayo had adapted the method to the study of serum proteins and had designed a "Perspex" box to allow eight papers to be prepared simultaneously. Mrs. Paton said that the technique had been used to separate serum protein into albumin and four globulin fractions on Whatman three-millimetre paper with 25 microlitres of serum. She described the technique in some detail and went on to say that by that means it had been possible to examine the alterations in the serum protein during pregnancy and in a variety of diseases, and the method had been found to be eminently suitable for routine clinical use when only small amounts of the serum were available. The method had also been used to show the presence of globulins in some cases of albuminuria and to show that in certain cases of nephritis, cholesterol was associated with β and γ globulin, and that serum alkaline phosphatase occurred in the a_2 globulin fraction.

Amino Acids in the Blood and Urine during Pregnancy.

MR. M. WELLBY discussed chromatographic techniques in relation to amino acids present in the blood and urine during normal and toxæmic pregnancies. He said that the method of partition chromatography of amino acids on paper, in other words, paper chromatography, as introduced by Consden, Gordon and Martin in 1944, had been adapted for use in clinical biochemistry by Dent in 1948. Dent and others had used the method to study a variety of conditions, including cystinuria, Franconi syndrome, acute yellow atrophy of the liver and multiple myelomatosis. In the present investigation of the serum and urinary amino acid levels associated with normal and toxæmic pregnancies, an apparatus designed by Datta, Dent and Harris had been used. It allowed the simultaneous production of twelve two-dimensional paper chromatograms of serum or urine in the short period of eight hours. It was found that during normal pregnancy, the serum amino acid level dropped, reaching a minimum a few weeks before the patient was delivered. The level of aspartic and glutamic acid, however, increased during pregnancy. There was a concomitant rise in amino acid excretion during pregnancy. The condition of pre-eclamptic toxæmia did not affect those changes. Mr. Wellby went on to say that as the increase in amino acid excretion was accompanied by a decrease in the serum level, a lowered renal threshold for amino acid probably occurred. The drop in serum amino acid level might be due in part to decreased protein catabolism and increased anabolism, or it was possible that the placenta, acting as a pump, extracted the amino-nitrogen from the maternal organism and built up the level on the fœtal side for the benefit of the rapidly growing fœtus.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

GOVERNMENT AND GENERAL ORDERS.[1]

Headquarters,
Sydney,
Saturday, 2nd Nov., 1816.

THE three criminals Colin Hunter, Michael Ryan, and Thomas Dooley, having been tried for and found guilty of the murder of William alias John Miller by the present Court of Criminal Jurisdiction which passed sentence on them yesterday, are to be executed pursuant to their respective sentences at the usual place of Execution on

[1] From the original in the Mitchell Library, Sydney.

Monday next the 4th of this present month of November between the Hours of Eight o'clock in the morning and 12 o'clock at noon: and when Dead their Bodies are to be taken down and delivered over to the Surgeons for the purpose of being dissected and anatomized agreeably to the sentence of the Court.

The whole of the Government gangs of artificers and labourers are to be marched to the Place of Execution by their respective Superintendents and Overseers at eight o'clock on Monday morning to witness the disgraceful and awful fate of the criminals. The 46th Regiment under arms is to parade at the Place of Execution at 8 o'clock on Monday morning.

By command of His Excellency the Governor,

H. C. ANTILL,
Major of Brigade.

Correspondence.

TREATMENT OF SUBARACHNOID HÆMORRHAGE.

SIR: I have read with much interest the account of the conservative surgical treatment of spontaneous subarachnoid hæmorrhage by Mr. John Dowling in a recent issue of THE MEDICAL JOURNAL OF AUSTRALIA, and whilst complimenting him on his successful series of cases treated by carotid ligation which is no doubt in keeping with the tradition of Sir Jeffery Jefferson, of Manchester, I should like to point out that the intracranial attack on saccular aneurysms is now being fairly generally recognized overseas and is the operation of choice in the majority of cases. With the advent of controlled hypotension in anæsthesia the mortality of such operations has been reduced from 25% in the series described by Dandy to 18% described by Murray Falconer (1951), 7% recorded by Norlen and Olivecrona (1951), and 2% for interval cases claimed by Norlen in 1953 (personal communication).

Since my tour of England and Scandinavia last year I have been impressed with the ease with which aneurysms, their parent vessels and surrounding vessels can be dissected when the general systemic blood pressure is reduced below 85 millimetres of mercury and preferably between 80 and 65 millimetres of mercury. Recently at the Royal Prince Alfred Hospital in five cases out of eight a sufficient fall of blood pressure was obtained for the operation to proceed according to the technique of Gosta Norlen. Two aneurysms were ligated at their neck, two packed around with muscle and one trapped. One arose from the internal carotid artery proximal to the posterior communicating and could be ligated and four arose from the anterior communicating or anterior cerebral arteries. No doubt with increased experience the number of cases in which the neck of the aneurysm can be cleanly dissected and ligated will increase and it should be remembered that in Norlen and Olivecrona's series ligation could be performed in 34 of 44 cases.

This clinical experience, limited though it may be, confirms my opinion that in a large percentage of cases the intracranial approach is the correct one, although, as stated by Mr. Dowling, each case has to be considered on its own merits. In my opinion, the above method represents the most satisfactory form of treatment that can be offered in the quiescent stage; that is any time after one week from the first bleeding. In these there is very little residual blood clot to hinder the careful dissection so necessary for the procedure. The correct time to operate is still in question, but as the incidence of recurrent hæmorrhage is only about 6% in the first week as against 65% to 70% in the first four weeks, presumably owing to relaxation of protective arterial spasm, one would feel justified in recommending operation at the end of the first week.

The surgical challenge that remains is the correct management of patients who have a second bleeding within the space of a few days or in whom there is a considerable derangement of consciousness or function from intracerebral blood clot or arterial spasm. However, recent experience has shown that even in these cases the direct surgical attack may meet with success.

According to the figures quoted by Murray Falconer for New Zealand and from perusal of the Registrar-General's statistics in Australia, it would appear that from 100 to 150 deaths *per annum* in New South Wales are attributable to subarachnoid hæmorrhage arising from ruptured aneurysm. From the work carried out overseas and here it would seem that a surgical method has been evolved for the management of these cases, which is an advance on other methods.

Yours, etc.,
Undated. STUART MORSON.

References.

NORLEN, G. (1952), "The Pathology, Diagnosis and Treatment of Intracranial Saccular Aneurysms", *Proc. Roy. Soc. Med.*, 45: 291.

FALCONER, MURRAY A. (1951), "The Surgical Treatment of Bleeding Intracranial Aneurysms", *J. Neurol., Neurosurg. & Psychiat.*, 14: 153.

AN ADDRESS.

SIR: The presidential address by Dr. B. S. Hanson in the August 29 issue was a notable one. Its directness and lack of unnecessary verbiage was a model on which other medical speakers and writers might well follow. The matters he discussed are obviously of prime importance to our profession in this country and elsewhere. One trusts that the points he emphasized and his keen appraisal of the factors involved in influencing men to follow the various post-graduate paths will be noted by all members of the profession, more especially those who are privileged to teach and advise medical students.

Yours, etc.,

"Braeside", R. S. DAY.
1 Miller Avenue,
Ashfield,
New South Wales.
October 6, 1953.

POLIOMYELITIS AND TONSILLECTOMY.

SIR: In recent times I have read articles linking the contraction of poliomyelitis with tonsillectomy. As I see it, two theories, backed by supporting investigations, have emerged and their implications are disquieting.

The first and older theory is that tonsillectomy should not be performed during a poliomyelitis epidemic because the operation areas, until healed, provide portals of entry for the virus. If this theory be accepted, tonsil operations should not be performed in any locality where this disease is epidemic.

The second theory (R. V. Southcott, M. J. AUSTRALIA, August 22, 1953) is that there is an association, lasting from five to ten years, between prior tonsillectomy and bulbar poliomyelitis. If this theory or association be accepted or not refuted, a dangerous situation exists. Obviously then the tonsillectomized patient is subjected, immediately, to a continuous (up to ten years) and an avoidable risk, presumably because the trauma of the tonsillectomy renders the motor nerves of the tonsillar region more accessible to the entry of the virus to them from the pharyngeal areas.

No surgeon would remove tonsils if he believed that the operation would predispose the patient to the contraction of bulbar poliomyelitis.

Dr. Southcott's investigations are very thorough, and his statistical findings appear conclusive. In view of them it would help tremendously if he could state to where the operation of tonsillectomy should now be relegated.

Yours, etc.,

"Inchcolm", RALPH WEAVER.
Wickham Terrace,
Brisbane.
October 7, 1953.

PRECOCIOUSNESS: CASE REPORT.

SIR: As I was in charge of the case of precociousness which was reported with Dr. R. Bowman in THE MEDICAL JOURNAL OF AUSTRALIA of September 19, 1953, and which brought forth comments by Professor L. Dods and Dr. E. Susman, may I reply to their letters?

In this case the usual teaching as to management was not followed. Half of the right suprarenal gland was removed, for it was nearly twice the size of the left. The pathological findings showed the presence of apparently normal

structure in the ovaries and suprarenal glands, and since the results of such examinations are not usually obtained it was considered that they were worthy of reporting. This paper was submitted as such a report and not with the intention of misleading the majority, or indeed any, of your readers. No suggestion was made that such exploratory operations should be performed as a routine in young girls with precocious puberty, and if this erroneous assumption has been made by any of your readers, may I correct it?

Much mystery still surrounds the suprarenal glands; but, however much Dr. Susman may deprecate it, "onslaughts" on these glands even to the extent of their bilateral ablation are no longer reprehensible or inelegant. I would agree that Dr. Susman's remarks are reminiscent of the past.

Yours, etc.,

EDWARD WILSON,
Honorary Surgeon, The St. George Hospital, Sydney; Tutor in Clinical Surgery, University of Sydney.

159 Macquarie Street,
Sydney,
October 10, 1953.

Medical Prizes.

THE SHORNEY PRIZE.

THE Shorney Prize, established for the purpose of perpetuating the memory of the late Herbert Frank Shorney, M.D., F.R.C.S., lecturer in ophthalmology in the University of Adelaide from 1926 to 1933, will be offered for the fifth time in 1954, and will be for work in diseases of the ear, nose and throat.

The relevant clauses of the Statute are as follows:

3. A post-graduate prize, to be called The Shorney Prize, of the value of £100, shall be awarded to the candidate who in the opinion of the examiners has made the most substantial contribution to knowledge in the subjects of ophthalmology or of diseases of the ear, nose and throat. The prize shall be offered alternately for work in ophthalmology and in diseases of the ear, nose and throat.
4. The recipient must be a graduate of an Australian university.
5. The material submitted for the prize may be either a thesis or published work in medical or scientific literature.
6. Each candidate must declare that the work described is his own.
7. The prize shall be offered for competition from time to time as the accumulations of the fund permit.
8. The prize shall be offered at least twelve months before the last day for the receipt of applications.
9. The prize shall not be awarded on any occasion unless in the opinion of the examiners the material submitted is of sufficient merit.

Applications, accompanied by three copies of the evidence which the candidates wish to submit in support, must reach the Registrar, the University of Adelaide, not later than September 30, 1954.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 60, of October 1, 1953.

AUSTRALIAN MILITARY FORCES.

Australian Regular Army.

Royal Australian Army Medical Corps.

To be Temporary Major, 6th August, 1953.—3/40112 Captain G. A. Rutherford.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED SEPTEMBER 19, 1953.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	3(2)	1(1)	..	..	..	..	..	..	4
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	..	..	..	..	1	..	1
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	1	..	..	..	..	..	..	..	1
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	1(1)	..	..	..	..	..	..	1
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	2(1)	1	7(6)	..	..	..	2	..	12
Diphtheria	4(3)	2(2)	..	1(1)	4(4)	..	..	..	11
Dysentery (Bacillary)	..	1(1)	1(1)	..	..	3(2)	..	..	5
Encephalitis	..	..	..	..	..	..	..	..	..
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	1	..	..	1
Infective Hepatitis	..	16(5)	..	..	8(2)	..	1	..	25
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	..	..	..	..	..	..	..
Leptospirosis	..	..	1(1)	..	..	..	..	..	1
Malaria	..	..	..	..	2(2)	..	..	..	2
Meningococcal Infection	..	3(1)	2(1)	..	..	..	..	..	5
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	4(1)	3(2)	2	12(11)	2(2)	..	..	..	23
Puerperal Fever	1(1)	..	5(4)	1(1)	..	..	..	..	7
Rubella	..	23(12)	1	..	37(22)	..	1	..	62
Salmonella Infection	..	..	..	..	2(2)	..	..	..	2
Scarlet Fever	16(12)	29(21)	9(8)	1(1)	3(3)	1	..	..	59
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	1	..	..	..	..	..	1
Trachoma	..	..	..	..	..	..	..	..	..
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	63(55)	30(22)	32(17)	7(7)	5(3)	1	1	..	139
Typhoid Fever	5(3)	1	..	1(1)	..	..	..	..	7
Typhus (Flea-, Mite- and Tick-borne)	..	..	2(1)	..	..	..	..	..	2
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

Citizen Military Forces.

Eastern Command: Second Military District.

Royal Australian Army Medical Corps (Medical).—The period of appointment of 2/127800 Lieutenant-Colonel J. F. Sullivan, M.C., to command 8th Field Ambulance is extended until 1st April, 1954.

Southern Command: Third Military District.

Royal Australian Army Medical Corps (Medical).—The resignation of 3/101010 Captain (provisionally) S. H. Watson of his commission is accepted, 4th August, 1953. The following officers are appointed from the Reserve of Officers and to be Captains (provisionally), 27th July, 1953: Honorary Captains 3/50197 W. A. Syme and 3/129385 M. G. Whiteside. To be Temporary Lieutenant-Colonel, 1st July, 1953: 3/77537 Major G. G. Harkness.

Central Command: Fourth Military District.

Royal Australian Army Medical Corps (Medical).—The provisional ranks of the following officers are confirmed: 4/35323 Lieutenant-Colonel J. D. Rice and 4/32014 Captain H. H. A. Sauer.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps.

2nd Military District.—To be Honorary Captains: Ralph Garner, 3rd August, 1953, Thomas Joseph O'Neill, Raymond Maldwyn Hughes, Marcus Allan Coull and William Lyon Wise, 11th August, 1953, Ross Beresford Holland and Arthur Gerard O'Connor, 14th August, 1953, and Bruce White, 19th August, 1953. Honorary Captain J. F. B. Langdon is retired, 27th July, 1953.

3rd Military District.—To be Honorary Captains: David John Hewat, 19th July, 1953, and Lindsey Walter Knight and James Henry Pryor, 1st August, 1953.

ROYAL AUSTRALIAN AIR FORCE.

Permanent Air Force: Medical Branch.

The resignation of the following Flight Lieutenants is accepted: G. J. Fowler (023038), 10th August, 1953, B. Hartley (034368), 13th August, 1953, W. C. Gadd (04532), 21st August, 1953.

The probationary appointment of Squadron Leader H. T. Hardy (036451) is confirmed.

Flight Lieutenant J. McC. Morrison (036133) is granted the acting rank of Squadron Leader, 7th September, 1953.

The resignation of Group Captain C. J. N. Leleu, O.B.E. (03178), is accepted, 1st September, 1953.

Active Citizen Air Force: Medical Branch.

No. 23 (City of Brisbane) Squadron.—Redmond John Michael Byrne (015118) is appointed to a commission, 1st August, 1953, with the rank of Flight Lieutenant.—(Ex. Min. No. 97—Approved 25th September, 1953.)

Air Force Reserve: Medical Branch.

The following former officers are appointed to commissions with rank as indicated: (Squadron Leader) R. D. G. Vann (024187), 23rd July, 1953; (Flight Lieutenant) I. H. Ogilvy (257507), 31st July, 1953; F. G. Cox (427978), 3rd August, 1953.

John Rothwell Radcliff (268024) is appointed to a commission, 16th July, 1953, with the rank of Flight Lieutenant (Temporary Squadron Leader).

Nominations and Elections.

THE undermentioned have been elected as members of the New South Wales Branch of the British Medical Association: Cameron, Joan, M.B., B.S., 1953 (Univ. Sydney); Dunn, Ian MacPherson, M.B., B.S., 1953 (Univ. Sydney); Garrett, David Hugh, M.B., B.S., 1953 (Univ. Sydney); Hayter, Ross Smith, M.B., B.S., 1953 (Univ. Sydney); Jenkins, Eric Alfred, M.B., B.S., 1953 (Univ. Sydney); Paradice, William John Houston, M.S., B.S., 1953 (Univ. Sydney); Ralston, Elizabeth Geraldine, M.B., B.S., 1953 (Univ. Sydney); Shagrin, Paul Joseph (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Tompkins, Errol Bernard, M.B., B.S., 1953 (Univ. Sydney); Spears, Arthur Douglas, M.B., B.S., 1953 (Univ. Sydney); d'Arbon, Paul John Peter, M.B., B.S., 1952 (Univ. Sydney); Bell, James, M.B., B.S., 1930 (Univ. Sydney); Haynes, Elva Grace, M.B., B.S., 1946 (Univ. Sydney); Porritt, John Arnold, M.R.C.S. (Eng.), L.R.C.P. (Lond.), 1950.

Deaths.

THE following deaths have been announced:

O'SULLIVAN.—Richard Francis O'Sullivan, on October 10, 1953, at Melbourne, Victoria.

BREW.—George Alexander Brew, on October 12, 1953, at Melbourne.

Diary for the Month.

OCT. 24.—New South Wales Branch, B.M.A.: Branch Meeting.
OCT. 26.—Federal Council of B.M.A. in Australia (Adelaide).
OCT. 27.—New South Wales Branch, B.M.A.: Ethics Committee.
OCT. 28.—Victorian Branch, B.M.A.: Branch Council Meeting.
OCT. 29.—New South Wales Branch, B.M.A.: Extraordinary General Meeting.
OCT. 29.—South Australian Branch, B.M.A.: Scientific Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federal Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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